APPENDIX B
ECONOMIC ANALYSIS
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT
GENERAL DESIGN MEMORANDUM

PROJECT BENEFITS

B-1. Storm damage reduction projects generate both primary and incidental benefits. The primary tangible benefits of these projects include physical damages prevented, including damage to structural improvements, coastal armor, replacement of backfill, and prevention of loss of land. Incidental benefits generated by a storm damage reduction project would be those generated by increased recreational usage, and beneficial impacts to downdrift shores.

This appendix includes discussions of both primary benefits (i.e. storm damage prevention benefits) and incidental benefits (i.e. recreation benefits). Following those discussions, a summary of total project benefits and costs is provided.

Engineering Regulation 1105-2-100 (The Planning Guidance Notebook) provides economic evaluation procedures to be used in all Federal water resources planning studies. The guidelines specified in the October 1989 draft of ER 1105-2-100 were observed in preparing this report. The Federally mandated project evaluation interest rate of 8 percent, an economic period of analysis of 50 years and October 1993 prices were used to evaluate economic feasibility.

PRIMARY BENEFITS - STORM DAMAGE PREVENTION BENEFITS

B-2. The first step in determining damage prevention benefits is to develop a relationship between shoreline recession and storm (surge) events. A number of studies of storm effects have identified the storm surge as the most important variable relating to beach profile retreat (Dean 1976, Richardson 1977, Hughes and Chiu 1981, Vellinga 1983, 1986). The rise in water level during a storm, or storm surge, develops as the result of the supposition of astronomical tide, wave setup, and meteorological (wind and pressure fields) surge. A change in water level does not in itself cause erosion, wave action is required. The most important wave parameter controlling beach profile change is the deep water wave height and wave steepness (the ratio of wave height to wave length). Other pertinent factors

include the beach grain size and mean beach slope. The first step determining damage prevention benefits is to develop a relationship between shoreline recession and storm (surge) events.

STORM DAMAGE ($) MODEL

B-3. Based on the use of a shoreline storm response model, a relationship can be developed between storm frequency and shoreline recession. By a combination of field examination and the use of aerial photography, a relationship between shoreline recession and damage to structures and development can be determined. The relationship between probability and damages can then be determined by tabulating total damage estimates for varying frequency storm events. Probability of occurrence for each event is defined on the basis that the storm event could be equaled or exceeded in a given year. The frequency-damage curve is then integrated to produce average annual damages for the 1993, (existing) condition.

The assessment of damages to existing development is based on conditions at the time of beach profile surveys. Due to continuing erosion and shoreline recession over time, future damages to development would be more severe with a given storm. Therefore, the shoreline recession-damage relationship is modified to accommodate the expected shoreline position in future years with respect to the reference shoreline. Future year damages are simulated by determining the location of the shoreline in future years using the historical erosion rate for the problem area. Future long-term recession is halted at the year when an existing seawall or protective structure is encountered. In some instances, future damages could be less if a coastal armor replacement index is selected which provides greater protection than the current coastal armor type. In addition, if a coastal armor type is selected which does not halt shoreline recession (i.e. the value of the structural improvement is not worth protection), and the future shoreline position exceeds the distance to full value,, then the structural improvement is condemned and removed from the data base at the year of condemnation.

Using this new information, a frequency-damage relationship is constructed for each year of the project life. The resulting estimates of expected damage are converted to an average annual equivalent basis using an interest rate of 8 percent for the 50-year period of analysis.

An analysis of with project storm damage is conducted similarly to without project storm damage. The average annual equivalent storm damage prevention benefit is the difference between the average annual equivalent value of the without and with project storm damage.

The Jacksonville District has developed an empirical computer model to simulate damages at existing and future years and compute average annual equivalent damages. This model is referred to as the Storm Damage ($) Model (SDM). For the purposes of the SDM, storm damage is defined as the damage incurred by the temporary loss of a given amount of shoreline as a direct result of wave attack caused by a storm of a given magnitude and frequency. Damages or losses to developed shorelines include buildings, pools, patios, parking lots, roads, utilities, seawalls, revetments, bulkheads, replacement of lost backfill etc. Assumptions used in the development of an estimate of annual storm damages are as follows:

MODEL ASSUMPTIONS

B-4. * The relationship of probability to shoreline recession will remain constant with time.

* Damage to improvements will not occur until shoreline recession has exceeded the seaward edge of the improvement.

* When the shoreline recedes halfway through a structure, the structure is considered a total loss (i.e. a single family home).

* When the shoreline recedes halfway through a structure with more than two stories with deeply embedded piles (such as high-rise condominiums), the structural value of only the bottom two floors is considered lost.

* If a structure is less than one-half undermined, the damage was assumed to be equal to the product of the structural value available for damage calculations and the ratio of the horizontal distance eroded through the structure divided by the mid-point of the distance through the structure.

* All market values of improvements were estimated by using a version of the Cost Approach to Value known as Replacement Cost New Less Depreciation.

* Content damage was not evaluated in this report.

* Seawalls, revetments and other coastal armor halt all damage from given storm until failure. The structure is assumed lost when the volume of scour in front of the structure is sufficient to allow structural failure.

* Although shorefront areas continue to develop through time, damage

estimates are limited to existing buildings and structures.

* Repair costs to the coastal armor and the cost of backfill are determined by current engineering estimates of replacement and/or repair costs of such work.

* After structural failure, the shorefront development, roads, parking lots, etc. will be repaired to a condition similar to and in the same location as the pre-storm conditions.

Specific input to the SDM is discussed in the following paragraphs.

MODEL INPUT

B-5. EXISTING AND FUTURE SHORELINE POSITION. The assessment of damages to existing development is based on conditions at the time of the 1993 beach profile survey. Continuous erosion and shoreline recession results in reduced beach width and hence protective value between a structure and the reference shoreline. Therefore, future damages to development are expected to be more severe with a given storm in future time periods. Future year damages are simulated in the model by description of the location of the reference shoreline in future years, as shown in Table B-1. The location of the reference shoreline is based on the historical shoreline recession rate for the study area. Future recession is halted at the year an existing seawall or other protective coastal armor is encountered.

B-6. FREQUENCY-SHORELINE RECESSION RELATIONSHIP. Relationships between exceedance probability and recession for Martin County, is used as model input. The frequency-shoreline recession relationship for Martin County is shown in Table B-1.

B-7. COASTAL PROTECTIVE ARMOR. Field inspections were made in July 1993 to determine the type, general location and condition of coastal armor by lot in the study problem area. The coastal protective structures (or armor) were grouped and categorized as to level of protection provided, unit cost and damage factor, as shown in Table B-1. The level of protection provided by each armor type, based on the field inspection and engineering judgement, is the amount of shoreline recession each type of armor would prevent until failure. The unit replacement costs per linear foot are based on engineering cost estimates. The damage factor is the percent of armor repair/replacement needed after failure.

B-8. STRUCTURAL IMPROVEMENT VALUE. Estimates were developed for ocean-front improvements in the project area. The improvements include

single-family residential, multi-family residential and commercial structures. To determine structural values, the Jacksonville District Staff Appraiser utilized the Replacement Cost New Less Depreciation method. The Marshall/Swift and the Means construction cost handbooks were used to estimate Replacement Cost New of residential and commercial structures. The age-life depreciation method was then used to estimate accrued depreciation. Information in the County Property Appraiser's Office was also examined. The estimated values of the structural improvements are tabulated in Table B-2. The structures are listed in number sequence or description and corresponding monument number. The structures are listed in order from north to south, along with the nearest DNR survey monument, and can be identified on the selected plan plates. Engineering field inspections were made in July 1993 to determine the number of floors for each structure and to estimate the structural integrity of each building. Coastal Engineering Construction Manuals usually require that a multi-floor structure located on the beach be anchored properly and use deeply embedded piles. Foundation systems for mid- and high-rise structures are typically embedded deeply below existing ground to provide a safety margin against scour. This will limit damage susceptibility. It is assumed for this study that only the first two floors of multi-floor structures would be damaged. The other floors are expected to remain anchored to the columns. Structures of two stories or less are assumed to be on slabs or short post foundations which would incur damage up to the full structural values. In cases where structures were (1) greater than two floors in height and (2) had either garages or piles as ground floor structures, the structural value listed in Table B-2 was reduced to the value of just the bottom two floors and the number of floors was reduced to two so that the model would more accurately compute damages.

TABLE B-1

STORM DAMAGE MODEL INPUT
MARTIN COUNTY, FLORIDA SHORE PROTECTION PROJECT

YEAR	SHORE POSITION	YEAR	SHORE POSITION	YEAR	SHORE POSITION	YEAR	SHORE POSITION	YEAR	SHORE POSITION
1995	3.9	1996	5.2	1997	6.5	1998	7.8	1999	9.1
2000	10.4	2001	11.7	2002	13.0	2003	14.3	2004	15.6
2005	16.9	2006	18.2	2007	19.5	2008	20.8	2009	22.1
2010	23.4	2011	24.7	2012	26.0	2013	27.3	2014	28.6
2015	29.9	2016	31.2	2017	32.5	2018	33.8	2019	35.1
2020	36.4	2021	37.7	2022	39.0	2023	40.3	2024	41.6
2025	42.9	2026	44.2	2027	45.5	2028	46.8	2029	48.1
2030	49.4	2031	50.7	2032	52.0	2033	53.3	2034	54.6
2035	55.9	2036	57.2	2037	58.5	2038	59.8	2039	61.1
2040	62.4	2041	63.7	2042	65.0	2043	66.3	2044	67.6

EQUIVALENT PROFILE EXTENSION = 0 (Without Project Condition)

PROBABILITY	STORM INDUCED RECESSION
.010	212
.020	188
.050	159
.100	143
.200	127
.500	108

ARMOR INDEX	DESCRIPTION OF ARMOR	UNIT COST	LEVEL OF PROTECTION	DAMAGE FACTOR
1.	CON. WAVE RETURN SEAWL	260	75	1.00
2.	CONCRETE SHEET PILE -SM	289	75	1.00
3.	CONCRETE SHEET PILE -MD	316	80	1.00
4.	CONCRETE SHEET PILE -LG	335	85	1.00
5.	ROCK REVETMENT 2 TON	990	75	.40
6.	EMERGENCY SAND BAGGING	130	40	.50
7.	VARIABLE SEAWALL	259	70	1.00
8.	COLLAPSED SEAWL/RUBBLE	100	40	.50
9.	NO ACTION	0	0	.00

COST PER SQUARE UNIT OF BACKFILL AND VEGETATION = 1.15

TABLE B-2

MARTIN COUNTY, SHORE PROTECTION PROJECT
STORM DAMAGE MODEL INPUT TABLE

SITE DESCRIPTION	VALUE	WIDTH	FLOORS	DISTANCE TO ZERO VALUE	DISTANCE TO FULL VALUE	DISTANCE TO ARMOR	ARMOR INDEX	CONSTRUCTION INDEX
PRIVATE RESIDENCE	210200	110	2	150	190	80	9	6
CONDO 4	1144050	210	1	120	200	65	9	6
CONDO 4A	1144050	450	1	120	200	65	9	6
PRIVATE RESIDENCE	64875	190	1	105	140	90	9	6
UNDEVELOPED/ HIGHWAY	24000	450	1	470	530	400	9	5
COMMERCIAL	178150	230	2	280	340	100	9	6
PUBLIC PARKING LOT	62500	1050	1	230	350	220	9	6
CONCESSION STAND	11000	170	1	180	200	140	9	6
GEZEBO	3000	230	1	70	80	65	9	6
BATHHOUSE	5000	280	1	80	100	55	9	6
GAZEBO	3000	180	1	145	165	100	9	6
LIFEGUARD BUILDING	69625	670	1	150	170	100	9	6
HOTEL 2	989265	510	1	130	160	100	9	6
UNDEVELOPED/ HIGHWAY	45600	790	1	360	390	340	9	5
PRIVATE RESIDENCE	218550	130	1	100	160	55	9	6
PRIVATE RESIDENCE	186930	100	2	75	105	50	9	6
CONDO 5	267200	180	2	90	200	50	9	6
UNDEV PUBLIC/HIGHWAY	231200	4010	1	340	370	320	9	5
PRIVATE RESIDENCE	144625	100	2	70	80	60	9	6
GAZEBO	3000	110	1	65	75	50	9	6
CONDO 6	1454200	200	1	100	145	50	9	6
CONDO 6 POOL	15000	130	1	95	120	50	9	6
CONDO 6A	1454200	200	1	90	130	50	9	6
CONDO 6B	1454200	330	1	120	155	80	9	6
UNDEVELOPED/ HIGHWAY	31500	410	1	315	355	300	9	5
PRIVATE RESIDENCE	247500	80	2	65	90	60	9	6
CONDO 7	1273875	200	1	95	130	45	9	6
CONDO 7A	1273875	270	1	100	130	25	9	6
CONDO 8	2013567	300	2	80	140	50	9	6

TABLE B-2

MARTIN COUNTY, SHORE PROTECTION PROJECT
STORM DAMAGE MODEL INPUT TABLE

SITE DESCRIPTION	VALUE	WIDTH	FLOORS	DISTANCE TO ZERO VALUE	DISTANCE TO FULL VALUE	DISTANCE TO ARMOR	ARMOR INDEX	CONSTRUCTION INDEX
CONDO 8A	2013567	370	2	85	170	65	9	6
CONDO 8B	2013567	150	2	90	180	75	9	6
CONDO 9	1883700	120	2	90	175	90	9	6
CONDO 9A	1883700	120	2	150	200	80	9	6
CONDO 9B	1883700	150	2	160	200	75	9	6
UNDEV PUBLIC/HIGHWAY	34000	450	1	350	390	320	9	5
PRIVATE RESIDENCE	129825	210	2	85	95	75	9	6
PRIVATE RESIDENCE	133244	110	1	105	140	90	9	6
PRIVATE RESIDENCE	133244	130	1	85	105	80	9	6
UNDEVELOPED/ HIGHWAY	51000	680	1	410	450	400	9	5
CONDO 10	1582852	340	1	150	195	85	9	6
UNDEVELOPED/ HIGHWAY	17000	225	1	410	450	390	9	6
CONDO 11	1216925	190	1	115	200	110	2	2
CONDO 11A	1216925	135	1	90	160	60	2	2
CONDO 11 (CLUBHS)	25000	110	1	70	100	65	2	2
CONDO 12	567700	120	2	50	150	25	5	5
CONDO 12A	1605700	190	2	50	150	40	5	5
CONDO 13	1989750	440	1	80	175	75	3	3
CONDO 13 (CLUBHS)	20000	160	1	100	150	80	3	3
UNDEV PUBLIC/HIGHWAY	11000	150	1	390	430	370	9	5
CONDO 14	402204	140	1	75	150	50	5	5
UNDEVELOPED/ HIGHWAY	23000	410	1	430	460	410	9	6
PRIVATE RESIDENCE	416200	100	1	175	205	65	9	6
PRIVATE RESIDENCE	419225	120	1	155	200	55	9	6
PRIVATE RESIDENCE	405938	85	1	145	205	55	9	6
UNDEVELOPED/ HIGHWAY	61000	1080	1	460	490	430	9	6
PUBLIC PK GAZEBO	5000	230	1	130	150	70	9	6
PUBLIC BOATHOUSE	7000	300	1	90	100	80	9	6
PUBLC PK CONCESS. STN D	8000	40	1	250	272	90	9	6

TABLE B-2

MARTIN COUNTY, SHORE PROTECTION PROJECT
STORM DAMAGE MODEL INPUT TABLE

SITE DESCRIPTION	VALUE	WIDTH	FLOORS	DISTANCE TO ZERO VALUE	DISTANCE TO FULL VALUE	DISTANCE TO ARMOR	ARMOR INDEX	CONSTRUCTION INDEX
PUBLIC PK GAZEBO	5000	175	1	85	95	80	9	6
PUBLIC RESTROOM	7000	100	1	170	190	85	9	6
LIFEGUARD TOWER	1000	400	1	100	110	95	9	6
CONDO 15 (POOL)	15000	80	1	140	170	70	9	6
CONDO 15	1784550	80	1	180	270	70	9	6
CONDO 16	8413000	500	1	170	280	80	9	6
CONDO 17	3212900	330	1	165	220	85	9	6
CONDO 18	2321100	220	1	170	280	90	9	6
CONDO 19	2392100	450	1	175	250	95	9	6
CONDO 20	3352000	230	1	180	220	90	9	6
CONDO 21	935200	180	1	145	150	100	9	6

B-9. PHYSICAL DIMENSIONS. The model requires the width for each distinct or different coastal development. This is usually the lot width as measured from the aerial photography. Using aerial photography flown in June 1992, distances from the reference shoreline (mean high water) to (1) the location of existing or future coastal armor, (2) to the face of the structure (zero value), and (3) to the point of full value were measured. The 1985 mean high water line was adjusted based on the 1993 beach profile survey prior to making measurements from the aerials. In the case of structural improvements such as single family homes or condominiums, the full value distance point is the mid-point or center of the structure. In the case of pools or utilities, the full value distance point is one foot beyond the face of the improvement. In the case of roads or patios, the full value distance point is the landward edge of the improvement.

B-10. MISCELLANEOUS INFORMATION. The existing coastal armor type is listed in the data base by lot and is identified in Table B-2 as the armor index. The armor index is cross-referenced in the model to the input or armor type shown in Table B-1. The construction index listed in Table B-2 is the type of coastal armor to be built when the existing coastal armor has failed. If no coastal armor exists (identified in Table B-1 as Dummy Field), the location of armor construction was determined based on adjacent coastal armor and engineering judgment. The cost of backfill and vegetation is also added to the model input (shown in Table B-1). The value 1.15 is the dollar price per cubic foot times the depth of backfill replacement (two foot uniform depth assumed for all storms).

DAMAGE PREVENTION BENEFITS.

B-11. Based on the assumptions and the data input discussed previously, the model computes damages for each foot of storm recession distance. These computations are performed for each lot and then summarized by ten foot increments as structural damage ($s), armor damage ($a), and backfill ($b). Shoreline recession-damage tables for the Martin County beach areas, existing and future years, without and with project are shown in Tables B-3 and B-4. The assessment of damages to existing development is a function of the protection afforded by existing widths of beach and dunes. As a result of future erosion, damages to development in the future will tend to be more severe with a given storm due to the fact that the amount of beach protection between a structure and the shoreline will decrease with time. After the relationships between recession and damage are determined, relationships between probability and damage are then determined by assigning probabilities from the appropriate frequency-recession relationship shown in Table B-1. This computational process results in without and with project frequency-damage curves for the existing condition and each future

time increment analyzed. The frequency-damage relationships are integrated to produce average annual damages. Frequency-damage information and average annual damages for the without and with project conditions for authorized plan and modified plan are shown in Table B-5.

Shoreline movement is simulated by the model and average annual damages are computed for each year of the 50 year project life. These streams of average annual damages without and with the project for Martin County beach areas are appropriately amortized and discounted at the project interest rate of 8 precent. Average annual damage streams and average annual equivalent damage for Martin County Beach for both authorized and modified plans are presented in tables B-6, B-7 and B-8.

TABLE B-9

MARTIN COUNTY BEACHES
RECESSION–DAMAGE TABLE
WITHOUT PROJECT CONDITION ($ 1,000)

AUTHORIZED PLAN

RECESS (Feet)	1995 DAMAGE S–EXISTING CONDITIONS $e	$b	$e	SUM	2005 DAMAGE S–EXISTING CONDITIONS $e	$b	$e	SUM	2115 DAMAGE S–EXISTING CONDITIONS $e	$b	$e	SUM	2025 DAMAGE S–EXISTING CONDITIONS $e	$b	$e	SUM	2035 DAMAGE S–EXISTING CONDITIONS $e	$b	$e	SUM	2045 DAMAGE S–EXISTING CONDITIONS $e	$b	$e	SUM
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
	0	3	0	3	0	4	0	4	0	1	0	1	0	20	0	20	100	21	0	120	41	32	0	73
	0	6	0	6	0	7	0	7	0	34	0	34	0	60	0	133	205	82	0	286	340	112	0	453
	0	17	0	17	0	34	0	34	26	60	0	86	240	110	0	362	610	153	0	763	629	212	0	841
50	0	43	0	43	11	86	0	86	100	165	0	275	865	177	0	1,042	1,021	243	0	1,264	978	309	0	1,287
	77	84	0	162	121	98	0	219	547	164	0	710	2,272	244	0	2,516	1,455	336	0	1,790	1,807	395	0	2,203
	200	136	0	406	365	154	0	540	1,756	225	0	1,980	3,968	317	0	4,285	3,377	415	0	3,792	3,490	464	0	3,964
	971	188	0	1,160	1,360	213	0	1,573	3,451	300	48	3,799	5,231	360	188	5,542	4,189	464	217	4,840	6,726	527	249	7,504
	2,813	262	48	2,923	3,246	354	48	3,578	5,182	375	188	5,610	6,110	460	170	6,740	7,101	542	249	7,872	10,298	576	366	11,263
100	4,714	334	48	5,096	5,242	360	188	5,830	7,886	440	170	8,346	10,262	567	340	10,969	11,414	585	366	12,365	13,854	615	439	14,907
	7,067	402	123	7,612	7,840	430	170	8,544	9,606	495	217	10,319	13,451	552	340	14,359	14,868	621	439	15,948	17,958	635	439	19,032
	9,846	466	170	10,285	10,272	474	217	10,963	12,706	547	249	13,500	16,000	567	439	16,904	16,122	648	439	20,204	22,780	643	424	23,917
	11,840	512	249	12,601	12,523	527	249	13,299	15,255	601	366	16,224	19,561	611	439	20,139	20,262	662	494	25,007	27,569	649	494	28,732
	14,476	566	249	15,279	15,061	580	366	16,044	18,061	616	439	19,510	20,233	621	439	24,292	23,721	657	494	28,871	31,866	653	494	33,015
150	16,463	599	439	17,511	17,242	600	439	18,279	21,532	664	439	22,204	23,549	635	494	24,258	25,268	666	494	34,081	36,000	657	494	37,151
	18,510	612	439	20,567	20,064	616	439	21,719	23,705	666	494	27,865	25,800	666	494	26,761	30,706	666	494	37,866	38,068	670	494	40,232
	23,795	630	439	24,864	25,257	662	494	26,372	25,810	661	494	32,040	28,240	631	494	37,379	30,806	670	494	40,803	41,853	676	494	43,022
	28,714	625	494	29,832	30,140	666	494	31,350	26,227	664	494	28,265	29,430	636	494	40,561	41,261	661	494	43,126	44,149	679	494	45,321
	33,266	620	494	34,177	34,189	620	494	35,281	28,555	667	494	29,666	41,555	649	494	42,678	43,574	664	494	46,152	45,753	681	494	46,928
200	36,864	631	494	37,909	37,787	632	494	38,892	40,864	662	494	42,100	43,447	662	494	44,303	45,848	667	494	46,824	47,108	684	494	48,285
	38,724	636	494	40,858	40,347	648	494	41,484	42,862	666	494	44,041	45,268	666	494	46,262	46,869	666	494	48,183	48,230	687	494	49,410
	41,764	646	494	42,906	42,336	658	494	43,488	44,748	666	494	45,895	46,571	666	494	47,729	48,161	666	494	49,347	48,442	687	494	49,623
	43,832	662	494	44,776	44,187	666	494	45,394	46,178	661	494	47,268	47,268	661	494	48,902	48,266	664	494	49,752	48,462	687	494	49,643
	45,267	665	494	46,306	46,778	666	494	48,028	47,800	664	494	48,857	48,560	665	494	49,719	48,266	664	494	49,772	48,482	691	494	49,667
250	46,704	666	494	47,865	47,102	666	494	48,264	48,560	667	494	49,719	48,570	665	494	49,729	48,806	666	494	49,795	48,505	674	494	49,692
	47,960	666	494	49,104	48,268	661	494	49,413	48,570	667	494	49,750	48,800	664	494	49,764	48,820	701	494	49,820	48,533	735	494	49,761
	48,561	662	494	49,716	48,567	662	494	49,722	48,568	667	494	49,768	48,810	660	494	49,761	48,864	701	494	49,879	48,561	767	494	49,841
	48,561	662	494	49,736	48,567	662	494	49,742	48,610	671	494	49,776	48,848	665	494	49,824	48,862	708	494	49,968	48,938	808	494	49,940
	48,601	664	494	49,760	48,667	665	494	49,796	48,667	674	494	49,864	48,878	736	494	49,868	48,747	812	494	50,052	48,729	818	494	50,041
300	48,621	666	494	49,783	48,620	666	494	49,791	48,665	705	494	49,865	48,720	770	494	49,884	48,868	820	494	50,158	48,828	820	494	50,140
	48,648	666	494	49,831	48,667	706	494	49,866	48,666	770	494	49,869	48,811	700	494	50,004	48,868	827	494	50,263	48,865	822	494	50,181
	48,676	741	494	49,910	48,664	750	494	49,864	48,768	700	494	50,007	48,860	706	494	50,188	48,867	830	494	50,308	48,869	823	494	50,206
	48,729	777	494	50,000	48,766	782	494	50,001	48,872	800	494	50,166	48,860	700	494	50,270	48,911	830	494	50,334	48,898	826	494	50,215
	48,820	780	494	50,103	48,847	782	494	50,183	48,878	800	494	50,266	48,864	700	494	50,305	48,862	832	494	50,347	48,899	839	494	50,231
350	48,813	786	494	50,201	48,848	786	494	50,201	48,907	801	494	50,202	48,821	800	494	50,316	48,868	842	494	50,361	48,915	850	494	50,258
	48,863	786	494	50,272	48,890	786	494	50,370	48,921	800	494	50,317	48,864	800	494	50,364	48,868	864	494	50,388	48,935	860	494	50,288
	48,908	787	494	50,297	48,918	786	494	50,365	48,923	800	494	50,322	48,862	830	494	50,346	48,864	864	494	50,416	48,958	876	494	50,328
	48,922	788	494	50,316	48,923	800	494	50,316	48,929	821	494	50,341	48,862	830	494	50,376	48,880	870	494	50,463	48,983	893	494	50,370
	48,924	807	494	50,325	48,928	812	494	50,331	48,940	801	494	50,370	48,879	842	494	50,490	48,906	888	494	50,488	48,994	911	494	50,399
400	48,934	820	494	50,348	48,940	838	494	50,367	48,966	841	494	50,490	48,890	860	494	50,461	48,120	914	494	50,527	49,012	919	494	50,424
	48,964	830	494	50,376	48,966	838	494	50,367	48,966	860	494	50,442	49,117	877	494	50,488	48,138	904	494	50,562	49,036	920	494	50,449
	48,976	843	494	50,412	48,968	840	494	50,425	49,118	870	494	50,485	49,120	881	494	50,514	48,158	920	494	50,577	49,060	920	494	50,473
	49,100	861	494	50,465	48,198	888	494	50,497	49,122	884	494	50,510	49,150	886	494	50,538	49,162	888	494	50,801	49,068	920	494	50,481
	49,118	879	494	50,489	48,120	884	494	50,498	49,148	880	494	50,535	49,178	886	494	50,568	49,184	888	494	50,814	49,072	920	494	50,485
450	49,131	881	494	50,516	48,137	880	494	50,523	49,167	880	494	50,560	49,193	886	494	50,581	49,198	888	494	50,818	49,078	920	494	50,489
	49,153	884	494	50,540	48,160	884	494	50,540	49,182	880	494	50,564	49,197	886	494	50,588	49,202	888	494	50,822	49,080	920	494	50,493
	49,177	884	494	50,565	48,184	884	494	50,572	49,198	880	494	50,580	49,201	886	494	50,589	49,200	888	494	50,826	49,081	920	494	50,494
	49,193	884	494	50,581	48,194	884	494	50,582	49,200	880	494	50,582	49,205	886	494	50,593	49,200	888	494	50,827	49,081	920	494	50,494
	49,197	884	494	50,586	48,198	884	494	50,586	49,204	880	494	50,588	49,208	886	494	50,588	49,200	888	494	50,827	49,081	920	494	50,494
500	49,197	884	494	50,586	48,202	884	494	50,590	49,208	880	494	50,590	49,208	886	494	50,588	49,208	888	494	50,827	49,081	920	494	50,494

TABLE B-3a

MARTIN COUNTY BEACHES
RECESSION–DAMAGE TABLE
WITHOUT PROJECT CONDITION ($ 1,000)

MODIFIED PLAN

RECESS (Feet)	1995 DAMAGE S–EXISTING CONDITIONS $a	$b	$c	SUM	2005 DAMAGE S–EXISTING CONDITIONS $a	$b	$c	SUM	2115 DAMAGE S–EXISTING CONDITIONS $a	$b	$c	SUM	2025 DAMAGE S–EXISTING CONDITIONS $a	$b	$c	SUM	2035 DAMAGE S–EXISTING CONDITIONS $a	$b	$c	SUM	2045 DAMAGE S–EXISTING CONDITIONS $a	$b	$c	SUM
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	5	2	0	7	0	4	0	4
	0	3	0	3	0	4	0	4	0	1	0	1	0	20	0	20	100	11	0	111	38	18	0	57
	0	6	0	6	0	7	0	7	0	04	0	04	05	62	0	130	204	50	0	250	330	69	0	399
	0	17	0	17	0	04	0	04	20	04	0	02	242	99	0	342	601	99	0	700	616	134	0	750
50	0	43	0	43	11	53	0	64	100	91	0	200	000	132	0	001	1,000	154	0	1,162	965	196	0	1,161
	77	77	0	154	121	60	0	200	644	127	0	671	2,200	165	0	2,420	1,412	212	0	1,624	1,794	246	0	2,043
	269	114	0	383	304	135	0	510	1,740	160	0	1,900	3,900	204	0	4,140	2,192	263	0	2,455	3,446	263	0	3,770
	064	147	0	1,111	1,340	160	0	1,400	3,400	167	40	3,600	5,720	243	122	6,000	3,900	204	217	4,190	6,150	312	249	6,712
	2,601	190	40	2,820	3,234	191	40	3,470	5,100	200	120	5,400	7,704	270	170	8,101	6,254	257	240	6,820	9,320	332	368	10,040
100	4,701	217	40	4,960	5,320	220	120	5,660	7,220	270	170	7,660	9,560	300	240	10,110	9,413	257	360	10,150	12,440	347	439	13,227
	6,260	254	123	7,337	7,733	264	170	8,170	9,800	304	217	9,844	11,340	330	240	12,124	12,011	270	430	13,420	14,768	356	439	15,565
	9,234	284	176	9,697	9,775	302	217	10,291	10,804	301	240	11,474	13,000	342	430	14,466	15,227	300	430	16,046	16,566	365	494	17,425
	10,836	311	240	11,490	11,360	310	240	11,920	12,107	344	300	12,850	14,700	360	430	15,560	17,160	357	494	18,031	18,166	371	494	19,033
	12,537	331	240	13,117	12,667	330	300	13,700	13,204	360	430	14,114	17,400	360	430	18,260	18,700	361	494	19,561	19,246	374	494	20,114
150	14,229	343	430	15,000	14,774	340	430	15,550	17,050	360	430	17,850	19,370	360	494	20,020	19,870	394	494	20,961	20,177	376	494	21,048
	16,028	360	430	16,817	16,540	360	430	17,340	16,701	360	494	19,557	20,510	362	494	21,376	20,860	367	494	21,720	21,161	390	494	22,065
	17,730	366	430	18,524	18,222	357	494	19,073	20,211	360	494	21,300	21,260	360	494	22,112	21,704	407	494	22,605	22,187	395	494	23,075
	19,429	360	494	20,282	19,860	360	494	20,740	21,160	360	494	21,990	21,940	371	494	22,811	22,547	414	494	23,454	22,932	398	494	23,824
	20,864	362	494	21,540	20,913	360	494	21,760	21,700	371	494	22,565	22,560	362	494	23,402	23,050	417	494	23,960	23,296	401	494	24,190
200	21,366	364	494	22,230	21,890	360	494	22,464	22,425	360	494	23,284	23,077	360	494	23,865	23,421	410	494	24,324	23,473	403	494	24,369
	22,001	372	494	22,866	22,396	370	494	23,160	22,870	360	494	23,701	23,265	367	494	24,216	23,570	402	494	24,466	23,578	406	494	24,477
	22,836	362	494	23,313	22,762	360	494	23,600	23,260	361	494	24,115	23,625	360	494	24,480	23,704	405	494	24,622	23,595	406	494	24,495
	23,013	364	494	23,861	23,120	360	494	23,960	23,461	360	494	24,260	23,674	360	494	24,560	23,716	400	494	24,637	23,615	406	494	24,515
	23,371	367	494	24,251	23,430	360	494	24,210	23,620	360	494	24,210	23,718	360	494	24,560	23,736	400	494	24,667	23,635	410	494	24,539
250	23,540	360	494	24,423	23,546	361	494	24,400	23,700	360	494	24,560	23,732	360	494	24,620	23,750	400	494	24,660	23,656	413	494	24,565
	23,848	362	494	24,374	23,704	360	494	24,591	23,720	360	494	24,610	23,752	360	494	24,642	23,770	400	494	24,705	23,686	454	494	24,634
	23,714	364	494	24,601	23,720	364	494	24,607	23,746	360	494	24,600	23,772	401	494	24,660	23,807	404	494	24,704	23,714	506	494	24,713
	23,734	364	494	24,621	23,740	364	494	24,627	23,766	400	494	24,660	23,790	417	494	24,700	23,835	410	494	24,643	23,761	527	494	24,812
	23,754	366	494	24,643	23,760	367	494	24,651	23,790	400	494	24,660	23,820	400	494	24,700	23,860	444	494	24,957	23,882	538	494	24,913
300	23,774	401	494	24,669	23,762	401	494	24,676	23,816	407	494	24,700	23,878	400	494	24,678	23,901	555	494	25,040	23,970	539	494	25,012
	23,801	422	494	24,716	23,810	407	494	24,740	23,846	360	494	24,840	23,864	521	494	24,870	24,060	560	494	25,138	24,016	541	494	25,053
	23,829	475	494	24,798	23,837	400	494	24,910	23,860	523	494	24,868	24,060	526	494	25,077	24,141	560	494	25,194	24,042	542	494	25,078
	23,882	500	494	24,865	23,900	514	494	24,910	24,020	532	494	25,051	24,158	526	494	25,158	24,164	561	494	25,219	24,049	545	494	25,088
	23,873	522	494	24,888	24,000	504	494	25,010	24,120	532	494	25,151	24,167	530	494	25,180	24,175	564	494	25,233	24,052	556	494	25,103
350	24,066	527	494	25,086	24,080	527	494	25,117	24,150	533	494	25,177	24,176	532	494	25,200	24,178	574	494	25,246	24,068	569	494	25,131
	24,130	530	494	25,157	24,143	530	494	25,165	24,174	536	494	25,202	24,177	530	494	25,200	24,191	580	494	25,271	24,088	579	494	25,160
	24,159	529	494	25,182	24,167	530	494	25,190	24,176	536	494	25,206	24,185	562	494	25,231	24,211	580	494	25,300	24,112	595	494	25,200
	24,175	531	494	25,200	24,178	532	494	25,201	24,178	560	494	25,220	24,205	562	494	25,260	24,234	611	494	25,338	24,136	612	494	25,242
	24,176	530	494	25,210	24,178	544	494	25,216	24,199	565	494	25,260	24,226	574	494	25,294	24,256	626	494	25,380	24,147	630	494	25,271
400	24,187	553	494	25,233	24,193	566	494	25,242	24,210	575	494	25,285	24,251	582	494	25,336	24,278	646	494	25,412	24,165	638	494	25,296
	24,207	562	494	25,263	24,213	566	494	25,272	24,245	591	494	25,285	24,270	609	494	25,373	24,286	660	494	25,457	24,189	639	494	25,321
	24,229	576	494	25,298	24,230	561	494	25,310	24,266	600	494	25,370	24,282	625	494	25,300	24,311	666	494	25,482	24,213	639	494	25,345
	24,253	593	494	25,340	24,261	600	494	25,362	24,276	600	494	25,366	24,290	627	494	25,424	24,336	660	494	25,487	24,221	639	494	25,353
	24,271	611	494	25,376	24,273	610	494	25,389	24,290	601	494	25,421	24,320	627	494	25,440	24,347	660	494	25,489	24,225	639	494	25,357
450	24,284	623	494	25,401	24,290	626	494	25,406	24,320	601	494	25,440	24,340	627	494	25,460	24,361	660	494	25,503	24,229	639	494	25,361
	24,300	620	494	25,420	24,313	626	494	25,433	24,345	601	494	25,460	24,360	627	494	25,470	24,366	660	494	25,507	24,233	639	494	25,365
	24,330	620	494	25,450	24,337	626	494	25,457	24,340	601	494	25,478	24,364	627	494	25,474	24,360	660	494	25,511	24,234	639	494	25,366
	24,340	620	494	25,460	24,346	626	494	25,467	24,365	601	494	25,477	24,360	627	494	25,476	24,361	660	494	25,512	24,234	639	494	25,366
	24,350	620	494	25,470	24,352	626	494	25,471	24,367	601	494	25,481	24,361	627	494	25,481	24,361	660	494	25,512	24,234	639	494	25,366
500	24,350	620	494	25,470	24,356	626	494	25,476	24,361	601	494	25,486	24,361	627	494	25,481	24,361	660	494	25,512	24,234	639	494	25,366

Table B-4
Martin County Beaches
Recession–Damage Table
With Project Conditions ($1,000)
35 FOOT BERM

AUTHORIZED PLAN

FEC ES S (Feet)	1995 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2005 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2015 WITH 35-BERM PROJECT $a	$b	$c	SUM	2025 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2035 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2045 WITH 35-FOOT PROJECT $a	$b	$c	SUM
0	0	0	0	0	0	0	0	0	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
100	0	46	0	46	0	46	0	46	0	46	0	46	0	46	0	46	0	46	0	46	0	46	0	46
	90	80	0	170	90	80	0	170	90	80	0	170	90	80	0	170	90	80	0	170	90	80	0	170
	294	142	0	436	294	142	0	436	294	142	0	436	294	142	0	436	294	142	0	436	294	142	0	436
	1,077	201	0	1,278	1,077	201	0	1,278	1,077	201	0	1,278	1,077	201	0	1,278	1,077	201	0	1,278	1,077	201	0	1,278
	2,827	270	48	3,145	2,827	270	48	3,145	2,827	270	48	3,145	2,827	270	48	3,145	2,827	270	48	3,145	2,827	270	48	3,145
150	4,923	341	48	5,311	4,923	341	48	5,311	4,923	341	48	5,311	4,923	341	48	5,311	4,923	341	48	5,311	4,923	341	48	5,311
	7,366	406	123	7,897	7,366	406	123	7,897	7,366	406	123	7,897	7,366	406	123	7,897	7,366	406	123	7,897	7,366	406	123	7,897
	9,856	464	178	10,498	9,856	464	178	10,498	9,856	464	178	10,498	9,856	464	178	10,498	9,856	464	178	10,498	9,856	464	178	10,498
	11,826	510	246	12,582	11,826	510	246	12,582	11,826	510	246	12,582	11,826	510	246	12,582	11,826	510	246	12,582	11,826	510	246	12,582
	14,702	556	240	15,500	14,702	556	240	15,500	14,702	556	240	15,500	14,702	556	240	15,500	14,702	556	240	15,500	14,702	556	240	15,500
200	[illegible]	[illegible]	430	17,717	16,866	592	430	17,717	16,866	592	430	17,717	16,866	592	430	17,717	16,866	592	430	17,717	16,866	592	430	17,717
	19,816	614	430	20,820	19,876	614	430	20,820	19,876	614	430	20,820	19,876	614	430	20,820	19,876	614	430	20,820	19,876	614	430	20,820
	24,283	621	438	25,342	24,283	621	438	25,342	24,283	621	438	25,342	24,283	621	438	25,342	24,283	621	438	25,342	24,283	621	438	25,342
	29,213	625	494	30,331	29,213	625	494	30,331	29,213	625	494	30,331	29,213	625	494	30,331	29,213	625	494	30,331	29,213	625	494	30,331
	33,437	628	494	34,559	33,437	628	494	34,559	33,437	628	494	34,559	33,437	628	494	34,559	33,437	628	494	34,559	33,437	628	494	34,559
250	37,045	631	494	38,170	37,045	631	494	38,170	37,045	631	494	38,170	37,045	631	494	38,170	37,045	631	494	38,170	37,045	631	494	38,170
	39,942	640	494	41,076	39,942	640	494	41,076	39,942	640	494	41,076	39,942	640	494	41,076	39,942	640	494	41,076	39,942	640	494	41,076
	41,966	649	494	43,109	41,966	649	494	43,109	41,966	649	494	43,109	41,966	649	494	43,109	41,966	649	494	43,109	41,966	649	494	43,109
	43,817	652	494	44,963	43,817	652	494	44,963	43,817	652	494	44,963	43,817	652	494	44,963	43,817	652	494	44,963	43,817	652	494	44,963
	45,510	655	494	46,659	45,510	655	494	46,659	45,510	655	494	46,659	45,510	655	494	46,659	45,510	655	494	46,659	45,510	655	494	46,659
300	46,836	658	494	47,988	46,836	658	494	47,988	46,836	658	494	47,988	46,836	658	494	47,988	46,836	658	494	47,988	46,836	658	494	47,988
	48,062	661	494	49,216	48,062	661	494	49,216	48,062	661	494	49,216	48,062	661	494	49,216	48,062	661	494	49,216	48,062	661	494	49,216
	48,563	662	494	49,719	48,563	662	494	49,719	48,563	662	494	49,719	48,563	662	494	49,719	48,563	662	494	49,719	48,563	662	494	49,719
	48,563	662	494	49,739	48,563	662	494	49,739	48,563	662	494	49,739	48,563	662	494	49,739	48,563	662	494	49,739	48,563	662	494	49,739
	48,803	664	494	49,761	48,803	664	494	49,761	48,803	664	494	49,761	48,803	664	494	49,761	48,803	664	494	49,761	48,803	664	494	49,761
350	48,823	669	494	49,785	48,823	669	494	49,785	48,823	669	494	49,785	48,823	669	494	49,785	48,823	669	494	49,785	48,823	669	494	49,785
	48,851	695	494	49,839	48,851	695	494	49,839	48,851	695	494	49,839	48,851	695	494	49,839	48,851	695	494	49,839	48,851	695	494	49,839
	48,879	746	494	49,918	48,879	746	494	49,918	48,879	746	494	49,918	48,879	746	494	49,918	48,879	746	494	49,918	48,879	746	494	49,918
	48,738	779	494	50,010	48,738	779	494	50,010	48,738	779	494	50,010	48,738	779	494	50,010	48,738	779	494	50,010	48,738	779	494	50,010
	48,830	790	494	50,114	48,830	790	494	50,114	48,830	790	494	50,114	48,830	790	494	50,114	48,830	790	494	50,114	48,830	790	494	50,114
400	48,823	795	494	50,211	48,823	795	494	50,211	48,823	795	494	50,211	48,823	795	494	50,211	48,823	795	494	50,211	48,823	795	494	50,211
	48,865	798	494	50,274	48,865	798	494	50,274	48,865	798	494	50,274	48,865	798	494	50,274	48,865	798	494	50,274	48,865	798	494	50,274
	48,900	797	494	50,300	48,900	797	494	50,300	48,900	797	494	50,300	48,900	797	494	50,300	48,900	797	494	50,300	48,900	797	494	50,300
	48,922	800	494	50,316	48,922	800	494	50,316	48,922	800	494	50,316	48,922	800	494	50,316	48,922	800	494	50,316	48,922	800	494	50,316
	48,925	809	494	50,327	48,925	809	494	50,327	48,925	809	494	50,327	48,925	809	494	50,327	48,925	809	494	50,327	48,925	809	494	50,327
450	48,936	821	494	50,351	48,936	821	494	50,351	48,936	821	494	50,351	48,936	821	494	50,351	48,936	821	494	50,351	48,936	821	494	50,351
	48,956	831	494	50,381	48,956	831	494	50,381	48,956	831	494	50,381	48,956	831	494	50,381	48,956	831	494	50,381	48,956	831	494	50,381
	48,976	846	494	50,417	48,976	846	494	50,417	48,976	846	494	50,417	48,976	846	494	50,417	48,976	846	494	50,417	48,976	846	494	50,417
	49,103	863	494	50,459	49,103	863	494	50,459	49,103	863	494	50,459	49,103	863	494	50,459	49,103	863	494	50,459	49,103	863	494	50,459
	49,119	880	494	50,493	49,119	880	494	50,493	49,119	880	494	50,493	49,119	880	494	50,493	49,119	880	494	50,493	49,119	880	494	50,493
500	49,133	892	494	50,518	49,133	892	494	50,518	49,133	892	494	50,518	49,133	892	494	50,518	49,133	892	494	50,518	49,133	892	494	50,518

Table B-4b
Martin County/Beaches
Recession-Damage Table
With Project Conditions ($1,000)
35 FOOT BERM

MODIFIED PLAN

RECESS (Feet)	1996 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2006 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2016 WITH 35-BERM PROJECT $a	$b	$c	SUM
0	0	0	0	0	0	0	0	0	0	10	0	10
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	3	0	3	0	3	0	3	0	3	0	3
	0	6	0	6	0	0	0	0	0	0	0	0
	0	19	0	19	0	19	0	19	0	19	0	19
100	0	46	0	46	0	46	0	46	0	46	0	46
	90	80	0	170	90	80	0	170	90	80	0	170
	294	118	0	412	294	118	0	412	294	118	0	412
	1,069	150	0	1,219	1,069	150	0	1,219	1,069	150	0	1,219
	2,815	184	46	3,046	2,815	184	46	3,046	2,815	184	46	3,046
150	4,810	221	46	5,176	4,810	221	46	5,176	4,810	221	46	5,176
	7,210	258	123	7,591	7,210	258	123	7,591	7,210	258	123	7,591
	9,414	287	176	9,879	9,414	287	176	9,879	9,414	287	176	9,879
	11,095	314	249	11,658	11,095	314	249	11,658	11,095	314	249	11,658
	12,732	332	249	13,313	12,732	332	249	13,313	12,732	332	249	13,313
200	14,380	344	439	15,161	14,380	344	439	15,161	14,380	344	439	15,161
	16,200	351	439	16,990	16,200	351	439	16,990	16,200	351	439	16,990
	17,894	356	439	18,688	17,894	356	439	18,688	17,894	356	439	18,688
	19,808	359	494	20,461	19,808	359	494	20,461	19,808	359	494	20,461
	20,774	362	494	21,630	20,774	362	494	21,630	20,774	362	494	21,630
250	21,467	365	494	22,325	21,467	365	494	22,325	21,467	365	494	22,325
	22,160	373	494	23,027	22,160	373	494	23,027	22,160	373	494	23,027
	22,861	382	494	23,566	22,861	382	494	23,566	22,861	382	494	23,566
	23,049	385	494	23,927	23,049	385	494	23,927	23,049	385	494	23,927
	23,406	387	494	24,287	23,406	387	494	24,287	23,406	387	494	24,287
300	23,555	390	494	24,439	23,555	390	494	24,439	23,555	390	494	24,439
	23,703	393	494	24,589	23,703	393	494	24,589	23,703	393	494	24,589
	23,716	394	494	24,603	23,716	394	494	24,603	23,716	394	494	24,603
	23,730	394	494	24,623	23,730	394	494	24,623	23,730	394	494	24,623
	23,756	396	494	24,646	23,756	396	494	24,646	23,756	396	494	24,646
350	23,776	401	494	24,671	23,776	401	494	24,671	23,776	401	494	24,671
	23,804	427	494	24,724	23,804	427	494	24,724	23,804	427	494	24,724
	23,832	478	494	24,803	23,832	478	494	24,803	23,832	478	494	24,803
	23,891	511	494	24,895	23,891	511	494	24,895	23,891	511	494	24,895
	23,983	522	494	24,999	23,983	522	494	24,999	23,983	522	494	24,999
400	24,076	527	494	25,096	24,076	527	494	25,096	24,076	527	494	25,096
	24,130	528	494	25,159	24,130	528	494	25,159	24,130	528	494	25,159
	24,162	530	494	25,185	24,162	530	494	25,185	24,162	530	494	25,185
	24,175	532	494	25,200	24,175	532	494	25,200	24,175	532	494	25,200
	24,178	541	494	25,212	24,178	541	494	25,212	24,178	541	494	25,212
450	24,189	554	494	25,236	24,189	554	494	25,236	24,189	554	494	25,236
	24,209	563	494	25,266	24,209	563	494	25,266	24,209	563	494	25,266
	24,231	577	494	25,302	24,231	577	494	25,302	24,231	577	494	25,302
	24,256	595	494	25,344	24,256	595	494	25,344	24,256	595	494	25,344
	24,272	612	494	25,378	24,272	612	494	25,378	24,272	612	494	25,378
500	24,288	624	494	25,403	24,288	624	494	25,403	24,288	624	494	25,403

RECESS (Feet)	2026 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2036 WITH 35-FOOT PROJECT $a	$b	$c	SUM	2046 WITH 35-FOOT PROJECT $a	$b	$c	SUM
0	0	10	0	10	0	10	0	10	0	19	0	19
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
	0	3	0	3	0	3	0	3	0	3	0	3
	0	6	0	6	0	6	0	6	0	6	0	6
	0	19	0	19	0	19	0	19	0	19	0	19
100	0	46	0	46	0	46	0	46	0	46	0	46
	90	80	0	170	90	80	0	170	90	80	0	170
	294	118	0	412	294	118	0	412	294	118	0	412
	1,069	150	0	1,219	1,069	150	0	1,219	1,069	150	0	1,219
	2,815	184	46	3,046	2,815	184	46	3,046	2,815	184	46	3,046
150	4,810	221	46	5,176	4,810	221	46	5,176	4,810	221	46	5,176
	7,210	258	123	7,591	7,210	258	123	7,591	7,210	258	123	7,591
	9,414	287	176	9,879	9,414	287	176	9,879	9,414	287	176	9,879
	11,095	314	249	11,658	11,095	314	249	11,658	11,095	314	249	11,658
	12,732	332	249	13,313	12,732	332	249	13,313	12,732	332	249	13,313
200	14,380	344	439	15,161	14,380	344	439	15,161	14,380	344	439	15,161
	16,200	351	439	16,990	16,200	351	439	16,990	16,200	351	439	16,990
	17,894	356	439	18,688	17,894	356	439	18,688	17,894	356	439	18,688
	19,808	359	494	20,461	19,808	359	494	20,461	19,808	359	494	20,461
	20,774	362	494	21,630	20,774	362	494	21,630	20,774	362	494	21,630
250	21,467	365	494	22,325	21,467	365	494	22,325	21,467	365	494	22,325
	22,160	373	494	23,027	22,160	373	494	23,027	22,160	373	494	23,027
	22,861	382	494	23,566	22,861	382	494	23,566	22,861	382	494	23,566
	23,049	385	494	23,927	23,049	385	494	23,927	23,049	385	494	23,927
	23,406	387	494	24,287	23,406	387	494	24,287	23,406	387	494	24,287
300	23,555	390	494	24,439	23,555	390	494	24,439	23,555	390	494	24,439
	23,703	393	494	24,589	23,703	393	494	24,589	23,703	393	494	24,589
	23,716	394	494	24,603	23,716	394	494	24,603	23,716	394	494	24,603
	23,730	394	494	24,623	23,730	394	494	24,623	23,730	394	494	24,623
	23,756	396	494	24,646	23,756	396	494	24,646	23,756	396	494	24,646
350	23,776	401	494	24,671	23,776	401	494	24,671	23,776	401	494	24,671
	23,804	427	494	24,724	23,804	427	494	24,724	23,804	427	494	24,724
	23,832	478	494	24,803	23,832	478	494	24,803	23,832	478	494	24,803
	23,891	511	494	24,895	23,891	511	494	24,895	23,891	511	494	24,895
	23,983	522	494	24,999	23,983	522	494	24,999	23,983	522	494	24,999
400	24,076	527	494	25,096	24,076	527	494	25,096	24,076	527	494	25,096
	24,130	528	494	25,159	24,130	528	494	25,159	24,130	528	494	25,159
	24,162	530	494	25,185	24,162	530	494	25,185	24,162	530	494	25,185
	24,175	532	494	25,200	24,175	532	494	25,200	24,175	532	494	25,200
	24,178	541	494	25,212	24,178	541	494	25,212	24,178	541	494	25,212
450	24,189	554	494	25,236	24,189	554	494	25,236	24,189	554	494	25,236
	24,209	563	494	25,266	24,209	563	494	25,266	24,209	563	494	25,266
	24,231	577	494	25,302	24,231	577	494	25,302	24,231	577	494	25,302
	24,256	595	494	25,344	24,256	595	494	25,344	24,256	595	494	25,344
	24,272	612	494	25,378	24,272	612	494	25,378	24,272	612	494	25,378
500	24,288	624	494	25,403	24,288	624	494	25,403	24,288	624	494	25,403

TABLE B-5

Storm Damage Calculations
Frequency-Damage Relationships
Existing (1995) Conditions
Without Project

Martin County Beach
Damage ($)

AUTHORIZED PALN

Frequency	Without Project (1995)	Without Project (2045)	With Project (1995)	With Project (2045)
100 Year	38,446,500	49,501,300	21,765,200	21,765,200
50 Year	28,848,000	46,637,400	14,946,800	14,946,800
25 Year	17,249,300	39,944,900	7,625,600	7,625,600
10 Year	13,249,300	34,315,800	3,768,600	3,768,600
5 Year	9,551,300	27,346,800	920,100	920,100
2 Year	4,649,500	18,165,400	150,100	150,100
Average Annual	5,947,300	17,862,100	1,208,800	1,208,800

MODIFIED PALN

Frequency	Without Project (1995)	Without Project (2045)	With Project (1995)	With Project (2045)
100 Year	22,390,600	24,486,200	17,336,900	17,336,900
50 Year	19,971,800	24,137,700	12,967,800	12,967,800
25 Year	14,817,100	21,960,500	7,345,400	7,345,400
10 Year	11,971,800	20,392,100	3,663,900	3,663,900
5 Year	9,032,700	18,597,500	873,000	873,000
2 Year	4,530,000	15,135,317	143,100	143,100
Average Annual	5,417,600	12,894,000	1,114,700	1,114,700

TABLE B-6
MARTIN COUNTY
Average Annual Damage Summary

WITHOUT PROJECT ($)

Year	Damage Upland Structures	Cost Backfill Vegetation	Damage Coastal Armor	Condemed Upland Structures	Modification Coastal Armor	Total Damages
1995	4780768	215157	91325		0	5,087,250
1996	5018833	220332	91325	0	0	5,330,490
1997	5140892	222898	91325	0	0	5,455,115
1998	5253111	225378	102611	0	0	5,581,100
1999	5476128	230412	110414	0	0	5,816,954
2000	5587636	232929	110414	0	0	5,930,979
2001	5702429	235408	110414	0	0	6,048,251
2002	5823595	237744	120842	0	0	6,182,181
2003	6056990	242508	127200	0	0	6,426,698
2004	6173687	244890	127200	0	0	6,545,777
2005	6291739	247246	127200	0	0	6,666,185
2006	6563952	251693	139308	0	0	6,954,953
2007	6716307	253850	139308	0	0	7,109,465
2008	6868661	256006	139308	0	0	7,263,975
2009	7174217	260093	139308	0	0	7,573,618
2010	7299234	261735	139308	0	0	7,700,277
2011	7424251	263377	139308	0	0	7,826,936
2012	7209252	267630	139308	0	35100	7,651,290
2013	7482860	270673	147357	0	0	7,900,890
2014	7614705	272244	175165	0	0	8,062,114
2015	7746550	273815	175165	0	0	8,195,530
2016	8010693	276949	175165	0	0	8,462,807
2017	8145764	278476	179933	0	0	8,604,173
2018	8282410	279905	190045	0	0	8,752,360
2019	8555702	282761	190045	0	0	9,028,508
2020	8690941	284190	190045	0	0	9,165,176
2021	8857287	285467	190045	0	0	9,332,799
2022	9038606	286637	190045	0	0	9,515,288
2023	9397510	288978	190045	0	0	9,876,533
2024	9571814	290148	190045	0	0	10,052,007
2025	9727848	291072	194163	0	0	10,213,083
2026	10055566	292544	194163	0	0	10,542,273
2027	10132078	295421	194163	0	26000	10,647,662
2028	10300570	296044	194163	0	0	10,790,777
2029	10635661	297241	215019	0	0	11,147,921
2030	10806592	297776	215019	0	0	11,319,387
2031	10661983	311374	215019	0	158600	11,346,976
2032	10853219	311222	215019	0	0	11,379,460
2033	11247873	310622	222603	0	0	11,781,098
2034	11452861	310248	222603	0	0	11,985,712
2035	11424259	315140	222603	0	79950	12,041,952
2036	11833207	313784	222603	0	0	12,369,594
2037	12035258	313091	233585	0	0	12,581,934
2038	12237309	312397	233585	0	0	12,783,291
2039	12619553	312884	233585	0	23400	13,189,422
2040	12801192	311995	233585	0	0	13,346,772
2041	12985028	311062	233585	0	0	13,529,675
2042	12419193	306709	276901	0	176800	13,179,603
2043	12798821	318915	233585	250500	0	13,601,821
2044	12990450	317277	233585	0	0	13,541,312
Average Annual Equivalent Damages (50yrs @ 8%)	6,621,500	248,600	132,500	500	2,300	7,005,400

TABLE B-7
MARTIN COUNTY
AVERAGE ANNUAL DAMAGE SUMMARY

WITH PROJECT, 35-FEET BERM ($)

Year	Damage Upland Structures	Cost Backfill Vegetation	Damage Coastal Armor	Condemed Upland Structures	Modification Coastal Armor	Total Damages
1995	1092456	100653	15,647	0	0	1,208,756
1996	1092456	100653	15,647	0	0	1,208,756
1997	1092456	100653	15,647	0	0	1,208,756
1998	1092456	100653	15,647	0	0	1,208,756
1999	1092456	100653	15,647	0	0	1,208,756
2000	1092456	100653	15,647	0	0	1,208,756
2001	1092456	100653	15,647	0	0	1,208,756
2002	1092456	100653	15,647	0	0	1,208,756
2003	1092456	100653	15,647	0	0	1,208,756
2004	1092456	100653	15,647	0	0	1,208,756
2005	1092456	100653	15,647	0	0	1,208,756
2006	1092456	100653	15,647	0	0	1,208,756
2007	1092456	100653	15,647	0	0	1,208,756
2008	1092456	100653	15,647	0	0	1,208,756
2009	1092456	100653	15,647	0	0	1,208,756
2010	1092456	100653	15,647	0	0	1,208,756
2011	1092456	100653	15,647	0	0	1,208,756
2012	1092456	100653	15,647	0	0	1,208,756
2013	1092456	100653	15,647	0	0	1,208,756
2014	1092456	100653	15,647	0	0	1,208,756
2015	1092456	100653	15,647	0	0	1,208,756
2016	1092456	100653	15,647	0	0	1,208,756
2017	1092456	100653	15,647	0	0	1,208,756
2018	1092456	100653	15,647	0	0	1,208,756
2019	1092456	100653	15,647	0	0	1,208,756
2020	1092456	100653	15,647	0	0	1,208,756
2021	1092456	100653	15,647	0	0	1,208,756
2022	1092456	100653	15,647	0	0	1,208,756
2023	1092456	100653	15,647	0	0	1,208,756
2024	1092456	100653	15,647	0	0	1,208,756
2025	1092456	100653	15,647	0	0	1,208,756
2026	1092456	100653	15,647	0	0	1,208,756
2027	1092456	100653	15,647	0	0	1,208,756
2028	1092456	100653	15,647	0	0	1,208,756
2029	1092456	100653	15,647	0	0	1,208,756
2030	1092456	100653	15,647	0	0	1,208,756
2031	1092456	100653	15,647	0	0	1,208,756
2032	1092456	100653	15,647	0	0	1,208,756
2033	1092456	100653	15,647	0	0	1,208,756
2034	1092456	100653	15,647	0	0	1,208,756
2035	1092456	100653	15,647	0	0	1,208,756
2036	1092456	100653	15,647	0	0	1,208,756
2037	1092456	100653	15,647	0	0	1,208,756
2038	1092456	100653	15,647	0	0	1,208,756
2039	1092456	100653	15,647	0	0	1,208,756
2040	1092456	100653	15,647	0	0	1,208,756
2041	1092456	100653	15,647	0	0	1,208,756
2042	1092456	100653	15,647	0	0	1,208,756
2043	1092456	100653	15,647	0	0	1,208,756
2044	1092456	100653	15,647	0	0	1,208,756
Average Annual Equivalent Damages (50yrs @ 8%)	1,092,500	100,700	15,600	0	0	1,208,800

TABLE B-8
MARTIN COUNTY
Average Annual Damage Summary

'Without Project, 35-FEET BERM ($)

MODIFIED PLAN

Year	Damage Upland Structures	Cost Backfill Vegetation	Damage Coastal Armor	Condemed Upland Structures	Modification Coastal Armor	Total Damages
1995	1026718	72401	15647	0	0	1,114,766
1996	1026718	72401	15647	0	0	1,114,766
1997	1026718	72401	15647	0	0	1,114,766
1998	1026718	72401	15647	0	0	1,114,766
1999	1026718	72401	15647	0	0	1,114,766
2000	1026718	72401	15647	0	0	1,114,766
2001	1026718	72401	15647	0	0	1,114,766
2002	1026718	72401	15647	0	0	1,114,766
2003	1026718	72401	15647	0	0	1,114,766
2004	1026718	72401	15647	0	0	1,114,766
2005	1026718	72401	15647	0	0	1,114,766
2006	1026718	72401	15647	0	0	1,114,766
2007	1026718	72401	15647	0	0	1,114,766
2008	1026718	72401	15647	0	0	1,114,766
2009	1026718	72401	15647	0	0	1,114,766
2010	1026718	72401	15647	0	0	1,114,766
2011	1026718	72401	15647	0	0	1,114,766
2012	1026718	72401	15647	0	0	1,114,766
2013	1026718	72401	15647	0	0	1,114,766
2014	1026718	72401	15647	0	0	1,114,766
2015	1026718	72401	15647	0	0	1,114,766
2016	1026718	72401	15647	0	0	1,114,766
2017	1026718	72401	15647	0	0	1,114,766
2018	1026718	72401	15647	0	0	1,114,766
2019	1026718	72401	15647	0	0	1,114,766
2020	1026718	72401	15647	0	0	1,114,766
2021	1026718	72401	15647	0	0	1,114,766
2022	1026718	72401	15647	0	0	1,114,766
2023	1026718	72401	15647	0	0	1,114,766
2024	1026718	72401	15647	0	0	1,114,766
2025	1026718	72401	15647	0	0	1,114,766
2026	1026718	72401	15647	0	0	1,114,766
2027	1026718	72401	15647	0	0	1,114,766
2028	1026718	72401	15647	0	0	1,114,766
2029	1026718	72401	15647	0	0	1,114,766
2030	1026718	72401	15647	0	0	1,114,766
2031	1026718	72401	15647	0	0	1,114,766
2032	1026718	72401	15647	0	0	1,114,766
2033	1026718	72401	15647	0	0	1,114,766
2034	1026718	72401	15647	0	0	1,114,766
2035	1026718	72401	15647	0	0	1,114,766
2036	1026718	72401	15647	0	0	1,114,766
2037	1026718	72401	15647	0	0	1,114,766
2038	1026718	72401	15647	0	0	1,114,766
2039	1026718	72401	15647	0	0	1,114,766
2040	1026718	72401	15647	0	0	1,114,766
2041	1026718	72401	15647	0	0	1,114,766
2042	1026718	72401	15647	0	0	1,114,766
2043	1026718	72401	15647	0	0	1,114,766
2044	1026718	72401	15647	0	0	1,114,766
Average Annual Equivalent Damages (50yrs @ 8%)	1,026,700	72,400	15600	0	0	1,114,700

Damages to various with project beaches were computed by increasing the pre-project beach width to the project beach width and repeating the recession-damage and frequency-damage computations. The total damages with the project are again represented by the area under the frequency-damage curves. Existing and future average annual damages were appropriately amortized and discounted at the project interest rate of 8 percent. The storm damage prevention benefits attributed to the project are the without-project damages minus the with-project damages. Average annual equivalent storm damage prevention benefits for the recommended plan are presented in Table B-9.

TABLE B-9

DAMAGE PREVENTION BENEFIT SUMMARY
(In $, computed at 8 %)

Annual Expected Damage

Alternative	Structures	Backfill	Armor	Total	Damages Prevented
Without Project Conditions	6,621,500	248,600	132,500	7,005,400	0
With Project Conditions	1,092,500	100,700	15,600	1,208,800	5,796,600

MODIFIED PLAN

Annual Expected Damage

Alternative	Structures	Backfill	Armor	Total	Damages Prevented
Without Project Conditions	5,742,100	166,100	135,500	6,043,500	0
With Project Conditions	1,026,700	72,400	15,600	1,114,700	4,888,600

SHORELINE STABILITY BENEFITS.

B-12. To determine the value of stabilizing the shoreline and preventing the loss of land to recession, the market value of the average annual area expected to be lost is estimated. This value was determined by Jacksonville District real estate appraiser as described in the following paragraphs.

The fair market value is defined as the amount in cash or equivalent that the property would be sold for by a knowledgeable and willing owner to a knowledgeable and willing buyer. Engineering Circular 165-2-149 requires that market value be determined based upon the value of nearshore land. Nearshore land is defined in the Engineering Circular as "land that is sufficiently removed from shore to lose it's significant increment of value because of it's proximity to the shore, when compared to adjacent parcels that are more distant from the shore." A gross estimate of ocean-front and near-shore lands were made by analyzing vacant land sales in the project area. Estimates of ocean-front lands are shown in Table B-10. Seven (7) vacant land sales were analyzed to estimate the market value of near-shore project land. All of the sales were located within the project limits (DNR #114-DNR #25 and are representative of the homogeneous neighborhood throughout the near-shore portions of the project. Average lot depth for the study area is approximately 300 feet. Comparable near-shore sales information for the project area are summarized in table B-11. The reported market value assigned to near-shore land is $5.00 per square foot.

TABLE B-10

ESTIMATES OF LAND VALUE

Category	Dollars per Front foot	Dollars per Square foot
Oceanfront:		
Commercial and Multi-Family (Condo)	2,300	7.70
Nearshore		5.00

TABLE B-11

NEARSHORE SALES INFORMATION

Sales Price	Size (Square Feet)	Unit Values (Square foot)
$ 65,000	14,520	$4.48
70,000	22,643	3.09
253,500	59,000	4.30
548,180	133,400	4.10
100,000	14,707	6.80
86,500	14,530	5.95
339,000	64,900	5.22

Parks and commercial areas have the same value for both oceanfront and non-oceanfront lands. Values for the lands are furnished in a price per front foot and price per square foot. The market recognizes and purchases land based on the front foot value and accordingly, the price per square foot unit tends to be inconsistently increasing as the depth of the lot diminishes. The concept of nearshore land value assumes that lots that are sufficient in distance from the shoreline loose their "proximity to shore" value. However, non-oceanfront lands in the condominium and multi- family category have a higher nearshore land value. This is due to the heavily eroded nature of the shoreline and the subsequent lack of lot depth for oceanfront property.

The second step in the estimation shoreline stabilization benefits is the determination of the area of land which would be lost in the absence of the project over the period of evaluation. The historical recession rate of 1.3 per year for the Martin County Study area was coupled with the location of existing and expected future locations of coastal armor on a lot by lot basis, and the expected land lost over the fifty year period of analysis was determined. Table B-12 displays the loss of land calculations.

The final step in the estimation of these benefits is the multiplication of the market value of the land times the average annual area lost. Table B-12 also summarizes the value of lands lost for future years. The average annual equivalent value of the land lost to the total project area would be using the directed interest rate (8 percent).

Evaluation of benefits at Federally-owned and at non-Federal public shores must reflect the special use to which the shore is dedicated, and the value of output produced by that use. Normally, non-Federal public shores are dedicated to park and conservation areas, and the benefits for protection of such shores are based on the loss in recreation outputs. Loss of land area shown in Table B-12 was categorized into non-Federal public and private land areas. Figure B-1 depicts an idealized case of shore ownership. The private lands subject to erosion are the lands between the pre-project mean high water line and the existing or future line of coastal armor. Similarly, the public pre-project lands subject to erosion are the lands between the existing mean high water and the existing or future line of coastal armor. Construction of the project will prevent the loss of both public and private lands. The average annual private loss of land benefit for the authorized project is $89,700; the average annual private loss of land benefit for the modified plan is $83,200. (See Table B-13.)

MAXIMIZATION OF NET BENEFITS

B-13. It is required in the "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies", March, 1983, a comprehensive part of ER-1105-2-100, that various alternative plans are to be formulated in a systematic manner to ensure that all reasonable alternatives are evaluated. Another requirement is that a plan that reasonably maximizes net national economic development benefits should be formulated. The formulation of this alternative requires an analysis to determine what degree of shoreline protection will maximize net storm damage prevention benefits. Net storm damage prevention benefit functions are analyzed by evaluating average annual equivalent storm damage prevention benefits less the average annual equivalent costs, for an array of plans with different degrees of protection. The results are measures of economic efficiency and the respective maximum identifies the degree of protection at which net benefits are maximized. The projects evaluated provide both storm damage prevention and recreation benefits. Because project cost sharing requirements are different for storm damage prevention and recreation benefits, and because recreation is not a high priority output for budget purposes, net benefits are maximized without recreation benefits.

Table B-14 displays this matrix which includes benefits, costs, net benefits, and benefit-to-cost ratios at the current interest rate of 8 percent. It is clear from this table that a project width of 100 feet maximizes net storm damage prevention benefits. Table B-15 provides a detailed summary of benefits and costs of the recommended plan without recreation.

TABLE B–12

AUTHORIZED PROJECT

MARTIN COUNTY SHORE PROTECTION PROJECT
EXISTING AND FUTURE YEARS, LOSS OF LAND BENEFITS

MAP OR PROFILE DATE 1993
BEGINNING OF PROJE 1995
INTEREST RATE DECIM 0.08000

DNR MONUMENTSTR #	RATE	LOT LENGTH (FT)	PRE-PROJECT RECESSION 1993 TO 95 (FEET)	RECESSION FROM 1995 TO 2045 (FEET)	EXISTING BEACH WIDTH (1993) (FT)	EXISTING BEACH WIDTH (1990) (FT)	YEAR SHORELINE RECEEDS TO COASTAL ARMOR	VALUE OF ** LANDS SUBJECT TO EROSION (PER/SQ FT)	BENEFITS
R1 #8	–1.3	110	–2.6	–65.0	78	75.4	58	$5.00	$715.00
R1 #9	–1.3	210	–2.6	–65.0	65	62.4	48	$5.00	$1,360.05
R1 #9a	–1.3	450	–2.6	–65.0	68	65.4	50	$5.00	$2,925.00
R2 #10	–1.3	190	–2.6	–65.0	88	85.4	66	$5.00	$1,235.00
R2 #11	–1.3	230	–2.6	–65.0	100	97.4	75	$5.00	$1,495.00
R3/4 SEATURTLE*	–1.3	450	–2.6	–65.0	105	102.4	79	$5.00	$2,925.00
R4/5 JENSEN*	–1.3	1,050	–2.6	–65.0	110	107.4	83	$5.00	$6,825.00
R4 #12	–1.3	170	–2.6	–65.0	75	72.4	56	$5.00	$1,105.00
R4 #12a	–1.3	230	–2.6	–65.0	65	62.4	48	$5.00	$1,489.58
R4 #13	–1.3	280	–2.6	–65.0	55	52.4	40	$5.00	$1,774.05
R5 #14	–1.3	180	–2.6	–65.0	100	97.4	75	$5.00	$1,170.00
R5 #15	–1.3	670	–2.6	–65.0	100	97.4	75	$5.00	$4,355.00
R6 #16	–1.3	510	–2.6	–65.0	105	102.4	79	$5.00	$3,315.00
R6 UNDEVEL	–1.3	790	–2.6	–65.0	95	92.4	71	$5.00	$5,135.00
R7 #17	–1.3	65	–2.6	–65.0	55	52.4	40	$5.00	$411.83
R7 #17a	–1.3	65	–2.6	–65.0	55	52.4	40	$5.00	$411.83
R7 #18	–1.3	100	–2.6	–65.0	50	47.4	36	$5.00	$622.57
R7 #19	–1.3	180	–2.6	–65.0	50	47.4	36	$5.00	$1,120.62
R7 #20	–1.3	100	–2.6	–65.0	62	59.4	46	$5.00	$644.90
R8–R11 BOB GRA.*	–1.3	2,005	–2.6	–65.0	70	67.4	52	$5.00	$13,032.50

TABLE B-12

MARTIN COUNTY SHORE PROTECTION PROJECT
EXISTING AND FUTURE YEARS, LOSS OF LAND BENEFITS (Continued)

MAP OR PROFILE DATE 1993
BEGINNING OF PROJE 1995
INTEREST RATE DECIM 0.08000

DNR MONUMEN	LOT #	RATE	LOT LENGTH (FT)	PRE-PROJECT RECESSION 1988 TO 90 (FEET)	RECESSION FROM 1990 TO 2040 (FEET)	EXISTING BEACH WIDTH (1988) (FT)	EXISTING BEACH WIDTH (1990) (FT)	YEAR SHORELINE RECEEDS TO COASTAL ARM(LINE	VALUE OF *** LANDS SUBJECT TO EROSION (PER/SQ FT)	BENEFITS
R12U ALEX'S *		-1.3	2,005	-2.6	-65.0	70	67.4	52	$5.00	$13,032.50
R12	#21	-1.3	110	-2.6	-65.0	50	47.4	36	$5.00	$684.82
R12	#22	-1.3	200	-2.6	-65.0	51	48.4	37	$5.00	$1,251.30
R12	#23	-1.3	130	-2.6	-65.0	50	47.4	36	$5.00	$809.34
R12	#24	-1.3	200	-2.6	-65.0	50	47.4	36	$5.00	$1,245.14
R13	#25	-1.3	330	-2.6	-65.0	80	77.4	60	$5.00	$2,145.00
R13/14 BRYN MAWR*		-1.3	410	-2.6	-65.0	70	67.4	52	$5.00	$2,665.00
R13	#26	-1.3	80	-2.6	-65.0	60	57.4	44	$5.00	$513.35
R13	#27	-1.3	200	-2.6	-65.0	45	42.4	33	$5.00	$1,223.53
R14	#27a	-1.3	270	-2.6	-65.0	25	22.4	17	$5.00	$1,308.58
R14 STOKES *		-1.3	55	-2.6	-65.0	55	52.4	40	$5.00	$348.47
R14	#28	-1.3	245	-2.6	-65.0	50	47.4	36	$5.00	$1,525.29
R15	#28a	-1.3	370	-2.6	-65.0	65	62.4	48	$5.00	$2,398.28
R15	#29	-1.3	150	-2.6	-65.0	75	72.4	56	$5.00	$975.00
R15	#30	-1.3	120	-2.6	-65.0	75	72.4	56	$5.00	$780.00
R15	#30a	-1.3	120	-2.6	-65.0	80	77.4	60	$5.00	$780.00
R15	#30b	-1.3	150	-2.6	-65.0	45	42.4	33	$5.00	$917.65
R15 VIRGIN FOREST*		-1.3	450	-2.6	-65.0	60	57.4	44	$5.00	$2,887.60
R16	#31	-1.3	210	-2.6	-65.0	80	77.4	60	$5.00	$1,365.00
R16	#32	-1.3	110	-2.6	-65.0	90	87.4	67	$5.00	$715.00
R16	#33	-1.3	130	-2.6	-65.0	100	97.4	75	$5.00	$845.00
R16	VAC.LOT	-1.3	680	-2.6	-65.0	400	397.4	306	$5.00	$4,420.00
R17	#34	-1.3	340	-2.6	-65.0	85	82.4	63	$5.00	$2,210.00
R17	VAC.LOT	-1.3	225	-2.6	-65.0	390	387.4	298	$5.00	$1,462.50
R18	#35	-1.3	190	-2.6	-65.0	100	97.4	75	$5.00	$1,235.00
R18	#35a	-1.3	135	-2.6	-65.0	50	47.4	36	$5.00	$840.47
R18	#35b	-1.3	110	-2.6	-65.0	50	47.4	36	$5.00	$684.82
R18	#36	-1.3	120	-2.6	-65.0	38	35.4	27	$5.00	$697.22
R18	#36a & b	-1.3	190	-2.6	-65.0	38	35.4	27	$5.00	$1,103.93
R19	#37	-1.3	440	-2.6	-65.0	90	87.4	67	$5.00	$2,860.00

TABLE B-12

MARTIN COUNTY SHORE PROTECTION PROJECT
EXISTING AND FUTURE YEARS, LOSS OF LAND BENEFITS (Continued)

MAP OR PROFILE DATE 1993
BEGINNING OF PROJE 1995
INTEREST RATE DECIM 0.08000

DNR MONUMEN	LOT #	RATE	LOT LENGTH (FT)	PRE-PROJECT RECESSION 1988 TO 90 (FEET)	RECESSION FROM 1990 TO 2040 (FEET)	EXISTING BEACH WIDTH (1988) (FT)	EXISTING BEACH WIDTH (1990) (FT)	YEAR SHORELINE RECEEDS TO COASTAL ARM(LINE	VALUE OF *** LANDS SUBJECT TO EROSION (PER/SQ FT)	BENEFITS
R19	#38	-1.3	160	-2.6	-65.0	90	87.4	67	$5.00	$1,040.00
R19 TIGER SHORES*		-1.3	150	-2.6	-65.0	70	67.4	52	$5.00	$975.00
R19	#39	-1.3	140	-2.6	-65.0	50	47.4	36	$5.00	$871.60
R19	VAC.LOT	-1.3	410	-2.6	-65.0	410	407.4	313	$5.00	$2,665.00
R20	#40	-1.3	100	-2.6	-65.0	65	62.4	48	$5.00	$647.64
R20	#41	-1.3	120	-2.6	-65.0	55	52.4	40	$5.00	$760.31
R20	#42	-1.3	85	-2.6	-65.0	55	52.4	40	$5.00	$538.55
R21 STUART BE ACH*		-1.3	1,080	-2.6	-65.0	50	47.4	36	$5.00	$6,723.73
R22	#43	-1.3	230	-2.6	-65.0	70	67.4	52	$5.00	$1,495.00
R22	#44	-1.3	300	-2.6	-65.0	85	82.4	63	$5.00	$1,950.00
R22	#44a	-1.3	40	-2.6	-65.0	90	87.4	67	$5.00	$260.00
R22	#45	-1.3	175	-2.6	-65.0	85	82.4	63	$5.00	$1,137.50
R22	#46	-1.3	100	-2.6	-65.0	85	82.4	63	$5.00	$650.00
R22	#47	-1.3	400	-2.6	-65.0	100	97.4	75	$5.00	$2,600.00
R23	#48	-1.3	80	-2.6	-65.0	70	67.4	52	$5.00	$520.00
R23	#48a & b	-1.3	80	-2.6	-65.0	70	67.4	52	$5.00	$520.00
R23	#49 & 50	-1.3	500	-2.6	-65.0	80	77.4	60	$5.00	$3,250.00
R24	#51	-1.3	330	-2.6	-65.0	85	82.4	63	$5.00	$2,145.00
R24	#52	-1.3	220	-2.6	-65.0	90	87.4	67	$5.00	$1,430.00
R25	#53	-1.3	450	-2.6	-65.0	95	92.4	71	$5.00	$2,925.00

TOTAL AVERAGE ANNUAL EQUIVALENT VALUE OF LANDSLOST =	139,100.05
*PUBLIC BEACHES & ACCESSES	49,414.80
VALUE LESS LAND USED FOR RECREATION	89,685.25
TOTAL PREVENTION OF LOST LAND CLAIMED (ROUNDED)	$89,700.00

TABLE B-13

MODIFIED PROJECT

MARTIN COUNTY SHORE PROTECTION PROJECT
EXISTING AND FUTURE YEARS, LOSS OF LAND BENEFITS

MAP OR PROFILE DATE 1993
BEGINNING OF PROJE(1995
INTEREST RATE DECIM 0.08000

DNR MONUMEN'STR #	RATE	LOT LENGTH (FT)	PRE-PROJECT RECESSION 1993 TO 95 (FEET)	RECESSION FROM 1995 TO 2045 (FEET)	EXISTING BEACH WIDTH (1993) (FT)	EXISTING BEACH WIDTH (1990) (FT)	YEAR SHORELINE RECEEDS TO COASTAL ARMOR	VALUE OF ** LANDS SUBJECT TO EROSION (PER/SQ FT)	BENEFITS
R1 #8	-1.3	110	-2.6	-65.0	78	75.4	58	$5.00	$715.00
R1 #9	-1.3	210	-2.6	-65.0	65	62.4	48	$5.00	$1,360.05
R1 #9a	-1.3	450	-2.6	-65.0	68	65.4	50	$5.00	$2,925.00
R2 #10	-1.3	190	-2.6	-65.0	88	85.4	66	$5.00	$1,235.00
R2 #11	-1.3	230	-2.6	-65.0	100	97.4	75	$5.00	$1,495.00
R3/4 SEATURTLE*	-1.3	450	-2.6	-65.0	105	102.4	79	$5.00	$2,925.00
R4/5 JENSEN*	-1.3	1,050	-2.6	-65.0	110	107.4	83	$5.00	$6,825.00
R4 #12	-1.3	170	-2.6	-65.0	75	72.4	56	$5.00	$1,105.00
R4 #12a	-1.3	230	-2.6	-65.0	65	62.4	48	$5.00	$1,489.58
R4 #13	-1.3	280	-2.6	-65.0	55	52.4	40	$5.00	$1,774.05
R5 #14	-1.3	180	-2.6	-65.0	100	97.4	75	$5.00	$1,170.00
R5 #15	-1.3	670	-2.6	-65.0	100	97.4	75	$5.00	$4,355.00
R6 #16	-1.3	510	-2.6	-65.0	105	102.4	79	$5.00	$3,315.00
R6 UNDEVEL	-1.3	790	-2.6	-65.0	95	92.4	71	$5.00	$5,135.00
R7 #17	-1.3	65	-2.6	-65.0	55	52.4	40	$5.00	$411.83
R7 #17a	-1.3	65	-2.6	-65.0	55	52.4	40	$5.00	$411.83
R7 #18	-1.3	100	-2.6	-65.0	50	47.4	36	$5.00	$622.57
R7 #19	-1.3	180	-2.6	-65.0	50	47.4	36	$5.00	$1,120.62
R7 #20	-1.3	100	-2.6	-65.0	62	59.4	46	$5.00	$644.90
R8-R11 BOB GRA.*	-1.3	2,005	-2.6	-65.0	70	67.4	52	$5.00	$13,032.50

TABLE B-13

MARTIN COUNTY SHORE PROTECTION PROJECT
EXISTING AND FUTURE YEARS, LOSS OF LAND BENEFITS (Continued)

MAP OR PROFILE DATE 1993
BEGINNING OF PROJE(1995
INTEREST RATE DECIM 0.08000

DNR MONUMEN'	LOT #	RATE	LOT LENGTH (FT)	PRE-PROJECT RECESSION 1966 TO 90 (FEET)	RECESSION FROM 1990 TO 2040 (FEET)	EXISTING BEACH WIDTH (1966) (FT)	EXISTING BEACH WIDTH (1990) (FT)	YEAR SHORELINE RECEEDS TO COASTAL ARMK LINE	VALUE OF *** LANDS SUBJECT TO EROSION (PER/SQ FT)	BENEFITS
R12U ALEX'S *		-1.3	2,005	-2.6	-65.0	70	67.4	52	$5.00	$13,032.50
R12	#21	-1.3	110	-2.6	-65.0	50	47.4	36	$5.00	$684.82
R12	#22	-1.3	200	-2.6	-65.0	51	48.4	37	$5.00	$1,251.30
R12	#23	-1.3	130	-2.6	-65.0	50	47.4	36	$5.00	$809.34
R12	#24	-1.3	200	-2.6	-65.0	50	47.4	36	$5.00	$1,245.14
R13	#25	-1.3	330	-2.6	-65.0	80	77.4	60	$5.00	$2,145.00
R13/14 BRYN MAWR*		-1.3	410	-2.6	-65.0	70	67.4	52	$5.00	$2,665.00
R13	#26	-1.3	80	-2.6	-65.0	60	57.4	44	$5.00	$513.35
R13	#27	-1.3	200	-2.6	-65.0	45	42.4	33	$5.00	$1,223.53
R14	#27a	-1.3	270	-2.6	-65.0	25	22.4	17	$5.00	$1,308.58
R14 STOKES *		-1.3	55	-2.6	-65.0	55	52.4	40	$5.00	$348.47
R14	#28	-1.3	245	-2.6	-65.0	50	47.4	36	$5.00	$1,525.29
R15	#28a	-1.3	370	-2.6	-65.0	65	62.4	48	$5.00	$2,396.28
R15	#29	-1.3	150	-2.6	-65.0	75	72.4	56	$5.00	$975.00
R15	#30	-1.3	120	-2.6	-65.0	75	72.4	56	$5.00	$780.00
R15	#30a	-1.3	120	-2.6	-65.0	80	77.4	60	$5.00	$780.00
R15	#30b	-1.3	150	-2.6	-65.0	45	42.4	33	$5.00	$917.65
R15 VIRGIN FOREST*		-1.3	450	-2.6	-65.0	60	57.4	44	$5.00	$2,887.60
R16	#31	-1.3	210	-2.6	-65.0	80	77.4	60	$5.00	$1,365.00
R16	#32	-1.3	110	-2.6	-65.0	90	87.4	67	$5.00	$715.00
R16	#33	-1.3	130	-2.6	-65.0	100	97.4	75	$5.00	$845.00
R16	VAC.LOT	-1.3	680	-2.6	-65.0	400	397.4	306	$5.00	$4,420.00
R17	#34	-1.3	340	-2.6	-65.0	85	82.4	63	$5.00	$2,210.00
R17	VAC.LOT	-1.3	225	-2.6	-65.0	390	387.4	298	$5.00	$1,462.50
R18	#35	-1.3	190	-2.6	-65.0	100	97.4	75	$5.00	$1,235.00
R18	#35a	-1.3	135	-2.6	-65.0	50	47.4	36	$5.00	$840.47
R18	#35b	-1.3	110	-2.6	-65.0	50	47.4	36	$5.00	$684.82
R18	#36	-1.3	120	-2.6	-65.0	38	35.4	27	$5.00	$697.22
R18	#36a & b	-1.3	190	-2.6	-65.0	38	35.4	27	$5.00	$1,103.93
R19	#37	-1.3	440	-2.6	-65.0	90	87.4	67	$5.00	$2,860.00

TABLE B-13

MARTIN COUNTY SHORE PROTECTION PROJECT
EXISTING AND FUTURE YEARS, LOSS OF LAND BENEFITS (Continued)

MAP OR PROFILE DATE 1993
BEGINNING OF PROJE 1995
INTEREST RATE DECIM 0.08000

DNR MONUMEN	LOT #	RATE	LOT LENGTH (FT)	PRE-PROJECT RECESSION 1988 TO 90 (FEET)	RECESSION FROM 1990 TO 2040 (FEET)	EXISTING BEACH WIDTH (1988) (FT)	EXISTING BEACH WIDTH (1990) (FT)	YEAR SHORELINE RECEEDS TO COASTAL ARM(LINE	VALUE OF *** LANDS SUBJECT TO EROSION (PER/SQ FT)	BENEFITS
R19	#38	-1.3	160	-2.6	-65.0	90	87.4	67	$5.00	$1,040.00
R19 TIGER SHORES*		-1.3	150	-2.6	-65.0	70	67.4	52	$5.00	$975.00
R19	#39	-1.3	140	-2.6	-65.0	50	47.4	36	$5.00	$871.60
R19	VAC.LOT	-1.3	410	-2.6	-65.0	410	407.4	313	$5.00	$2,665.00
R20	#40	-1.3	100	-2.6	-65.0	65	62.4	48	$5.00	$647.64
R20	#41	-1.3	120	-2.6	-65.0	55	52.4	40	$5.00	$760.31
R20	#42	-1.3	85	-2.6	-65.0	55	52.4	40	$5.00	$538.55
R21 STUART BE ACH*		-1.3	1,080	-2.6	-65.0	50	47.4	36	$5.00	$6,723.73
R22	#43	-1.3	230	-2.6	-65.0	70	67.4	52	$5.00	$1,495.00
R22	#44	-1.3	300	-2.6	-65.0	85	82.4	63	$5.00	$1,950.00
R22	#44a	-1.3	40	-2.6	-65.0	90	87.4	67	$5.00	$260.00
R22	#45	-1.3	175	-2.6	-65.0	85	82.4	63	$5.00	$1,137.50
R22	#46	-1.3	100	-2.6	-65.0	85	82.4	63	$5.00	$650.00
R22	#47	-1.3	400	-2.6	-65.0	100	97.4	75	$5.00	$2,600.00
R23	#48	-1.3	80	-2.6	-65.0	70	67.4	52	$5.00	$520.00
R23	#48a & b	-1.3	80	-2.6	-65.0	70	67.4	52	$5.00	$520.00
R23	#49 & 50	-1.3	500	-2.6	-65.0	80	77.4	60	$5.00	$3,250.00

TOTAL AVERAGE ANNUAL EQUIVALENT VALUE OF LANDS LOST = 132,600.05

*PUBLIC BEACHES & ACCESSES 49,414.80

VALUE LESS LAND USED FOR RECREATION 83,185.25

TOTAL PREVENTION OF LOST LAND CLAIMED (ROUNDED) $83,200.00

TABLE B-14

MARTIN COUNTY ECONOMIC SUMMARY
Interest Rate 8.00 percent

	ANNUAL COST	ANNUAL STORM INDUCED DAMAGES					TOTAL DAMAGES	ANNUAL DAMAGES PREVENTED	BENEFITS
		DEVELOP MENT	BACKFILL	ARMOR	CONDEMN STRUCT	MODIFY ARMOR			
EXISTING CONDITIONS		$6,621,500	$248,600	$131,500	$500	$2,300	$7,004,400		
20 FOOT PROJECT	$664,700	$2,143,200	$145,000	$38,600	$0	$0	$2,326,800	$4,677,600	$4,012,900
35 FOOT PROJECT	$849,100	$1,092,500	$100,700	$15,600	$0	$0	$1,208,800	$5,795,600	$4,946,500
35 FOOT PROJECT(MODIFIED PLAN)	1/ $953,700	$1,026,700	$72,400	$15,600	$0	$0	$1,114,700	2/ $4,888,600	$3,934,900
50 FOOT PROJECT	$938,200	$525,800	$62,200	$8,400	$0	$0	$596,400	$6,408,000	$5,469,800
75 FOOT PROJECT	$1,056,500	$153,400	$21,700	$2,000	$0	$0	$177,100	$6,827,300	$5,770,800
100 FOOT PROJECT	$1,177,200	$30,400	$6,500	$200	$0	$0	$37,100	$6,967,300	$5,790,100
125 FOOT PROJECT	$1,424,700	$2,000	$1,700	$0	$0	$0	$3,700	$7,000,700	$5,576,000

1. Annual cost includes environmental monitoring and lands and damages (LERRD) not inicuded in other plans displayed.

2. Annual damages prevented for the modified project were derived from existing damages excluding damages to the 2000-foot length of beach which is authorized for renourishment, but not included in the modified plan.

FIGURE B-1

SHORE OWNERSHIP AND LANDS SUJECT TO RECESSION

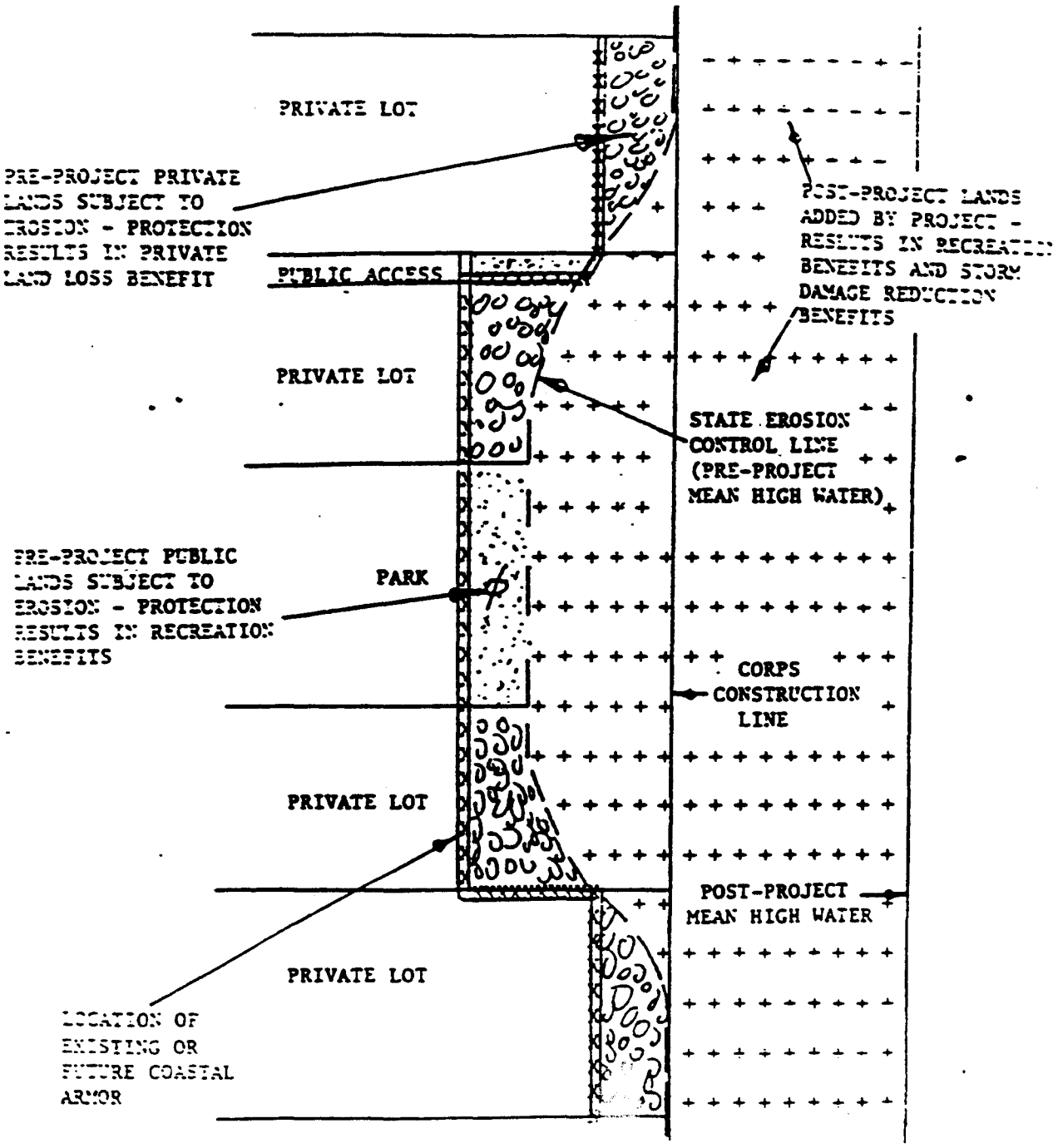

TABLE B-15

RECOMMENDED PLAN SUMMARY, RECREATION BENEFITS EXCLUDED
MARTIN COUNTY
($, using 8 Percent Interest Rate)

MODIFIED PLAN	
PROJECT COST	
Total First Cost (Construction)	$10,491,400
Interest During Construction	396,400
TOTAL INVESTMENT COST	$10,887,800
Annual Investment Cost	890,000
Future Renourishment	252,000
TOTAL ANNUAL COST	$ 1,142,000
PROJECT BENEFITS	
Prevention Of Damage To Development	$ 4,888,600
Loss Of Land	83,200
TOTAL PRIMARY BENEFITS	$ 4,971,800
Net Primary Benefits	$ 3,829,800
Benefit-To-Cost Ratio	4.4:1

RECREATION

B-14. The estimated recreational benefits attributable to the proposed beach protection project contained in this report are an updating of the analyses presented in the "Beach Erosion Control Study for Martin County, Florida" made by the Corps of Engineers in September, 1985 and revised in June, 1996. The benefits were determined using procedures based on those prescribed in the Manual of Procedures developed by the Water Resources Council and published in the December 1979 Federal Register (Volume 44, 242/Friday, December 1979).

Recreation benefits accrue from the preservation of or the increase in the use of shore front recreational facilities for beach activities which would be expected if beach conditions are improved. The methodology used in estimating recreation benefits entails determining the total beach visits to the Martin County Market Area under two different conditions, "With and Without" the project implemented. The difference of the results of the two analyses established beach visitors attributable to the considered work. Recreation benefits attributable to the considered works were determined by applying a value to the visits attributable to the new beach. The value of a beach visit was based on the results of analysis which utilized travel cost

methodology. No recreational benefits are claimed on privately owned land as this would duplicate damage prevention benefits to privately owned property and structures.

STUDY AREA

B-14. As related to analysis for recreation benefits, the principle study area is Martin County; however, visitors from other cities and counties in Florida and out of State also recreate in the study area. Out-of-State visitors to Martin County beaches are generally from western and central parts of the United States and other countries. The specific authorized project area extends along the Atlantic coast of Martin County, south from the northern boundry of the county line to a point of 2 miles north of Jupiter Inlet, for a distance of about 22 miles. The modified project area would extend a distance of approximately 21 ½ miles.

RECREATION DEMAND COMPUTATION

B-15. Data Sources and Use Standards - The Department of Natural Resources (DNR), Division of Recreation and Parks, concluded a study in 1970 to develop a comprehensive program for meeting Florida's outdoor recreation needs. In 1971, the State Comprehensive Outdoor Recreation Plan, (SCORP), entitled "Outdoor Recreation In Florida", was formally adopted by the Governor as the official outdoor recreation plan for the State of Florida. This report was updated and re-published in 1976, 1981, and 1989. This analysis relies upon use standards found in the 1976 report, projections found in the 1981 and 1989 reports, basic data gathering from county officials in the region , and statistical data used to produce the 1981 report. This information was used to derive and project total salt water beach participation and allocate this participation from region to county level. The statistical background data used to prepare the 1981 SCORP was purchased by contract from the DNR in 1983. This information is based upon a sample size of approximately 11,000 questionnaires on outdoor recreation and is used to derive the participation rates used in the study. The 1976 SCORP report states that each participant seeks at least 100 square feet of beach space for minimum comfort. In 1981, the use standard changed to 200 square feet. To maintain consistency of analysis methods with previous Corps reports, 100 square feet is utilized in this report. A turnover rate of two is utilized to account for the fact that the average beach visitor uses the beach for only one-half of a day, usually in the morning or in the afternoon. This means that twice the effective beach area and twice the effective parking capacity is available during a given day.

In a beach activity survey conducted by the DNR for the town of Jupiter Island in April, 1976, it was discovered that the average number of people per vehicle visiting the beaches was 3.91, with a range from one to ten people per vehicle. An average of four people per car is used in this analysis. Therefore, the number of people a parking area can support is equal to the number of cars the parking area can support multiplied by four multiplied by two.

B-16 Participation Rates - The SCORP report identifies the two sources of total beach use participation to be resident participation and tourist participation. These estimates of total participation are dependent upon estimates and projections of population and tourist activity. Participation rates are the accepted method of converting population and tourist projections to resident and tourist participation. In this report, county resident participation rates and State resident participation rates were computed from the supplemental statistical data mentioned above. The county participation rate is defined as the average number of times a county resident will participate in saltwater beach activities in his home county in a given year. The State participation rate is defined as the average number of times a resident of the state of Florida not located in Martin County will participate in saltwater beach activities in Martin county in a given year. Tourist participation rates were not available from the 1981 SCORP or the supplemental statistical information. Therefore, the DNR, Division of Recreation and Parks was contacted directly. A regional tourist participation rate was used for each county in region X. The tourist participation rate is defined as the average number of times a tourist visiting the State of Florida will participate in saltwater beach activities in the region in a given year. The State's definition of Region X includes, Martin County, Indian River County, Palm Beach County and St. Lucie County. Participation rates used in the study for residents and tourists are listed in Table B-16.

TABLE B-16

Resident and Tourist Participation Rates
Region X

Region IX Counties	(1) County Resident Participation Rate	(2) State Resident Participation Rate	(3) Regional Tourist Participation Rate
Indian River	3.876	0.003	2.84
Martin	3.451	0.003	2.84
Palm Beach	2.825	0.048	2.84
St. Lucie	1.702	0.027	2.84

(1) This rate was computed from the 1989 SCORP statistical information.
(2) This rate was computed from the 1989 SCORP statistical information.
(3) This rate is equivalent to the State Tourist participation rate computed in the 1989 SCORP statistical information

B-17. Regional Demand The selected method utilizes the 1981 and 1989 SCORP reports to compute total resident and tourist regional participation. It was not possible to separate resident and tourist user occasions for region X using these reports. However, from the 1989 report, tourist user occasions for the State of Florida is 2.84 total user occasions. This percentage was used to compute total tourist user occasions for region X. Total user occasions are projected in the SCORP through the year 1995. Total user occasions through the period 2046 were projected in ten year increments using a linear least squares regression through the 1981 and 1989 SCORP information. Total regional demand, resident, and tourist demand for region X are shown in Table B-17.

TABLE B-17

Total Regional Demand in User Occasions
Region X

Year	(1) SCORP Regional Resident Demand	(2) SCORP Regional Tourist Demand	(3) SCORP Total Regional Demand
1987	5,503,249	6,392,751	11,896,000
1990	5,126,049	7,640,951	13,767,000
1995	7,075,894	11,945,324	19,021,218
1996	7,228,599	12,291,738	19,520,337
2006	8,788,603	15,118,838	23,907,441
2016	10,230,637	17,689,041	27,919,678
2026	11,382,402	19,634,835	31,017,237
2036	12,270,457	20,616,577	32,887,034
2046	12,942,632	21,647,406	34,590,038

1. University of Florida, Medium Population Projection, Table 1.84, 1988, Statistical Abstract.

2. Percentage of State Tourist Demand as a % of Total Demand is 2.84.

3. Linear Extrapolation through 1987, 1990, 1995 Projection from 1989 SCORP.

Allocation of Regional Demand to County Demand - Allocation of regional demand to the county level is accomplished using the 1981 SCORP report, current University of Florida county population projections, and conversations with representatives of three of the four county planning departments in the region. Based upon these data, the annual beach activity demand was determined utilizing the following relationships:

CD = (PcNc + PsNs + PtNt) K where:
CD = County Beach activity demand
Pc = Constant from the statistical background data for the 1981 SCORP. This is the participation rate for county residents.
Ps = Constant from the statistical background data for the 1981 SCORP. This is the participation rate of residents from other Florida counties who recreate on Martin County beaches.
Pt = Constant from Telephone conversations with the Division of Recreation and Parks. This is the tourist participation rate for Martin County.
Nc = This is the county resident population.
Ns = This is the State population less the County population.
Nt = This is the County tourist population.
K = This is a constant which expresses the ratio of the total published demand for Region X in the 1989 SCORP and the computed total demand using the expression above.

Current estimates of state population and the 1989 SCORP resident participation rate have been utilized to compute resident participation for the region. The most recent state and county population projections are provided by the University of Florida, Bureau of Economic Research, Florida Statistical Abstract, 1988. These projections have been extrapolated from the year 1996 to 2046. The University of Florida population projections were utilized throughout the analysis to insure consistency with the SCORP reports. Participation rates are

constant over the project life.

Sufficient information is not available from the DNR to compute tourist participation rates at county level. However, the Regional tourist participation rate received from the DNR is considered a good proxy for county participation because of the relative homogeneity of shore front counties in Region X. Therefore, the rate for Tourist user occasions was obtain by dividing county resident population then applying this rate to county resident population to obtain tourist user occasions assuming that the same rate for county residents participation in saltwater beach activities apply to tourist. The regional tourist participation rate was then used to estimate the number of tourists visiting each county in the region. Total participation for each county in the region for each 10 year increment of the project life was then computed. Each county was then allocated a percentage of the total Region X demand based upon these county totals. An example of the allocation of Region X participation in the year 2006 is shown in Table B-18.

Distribution of County Demand Within the Project Area - The Martin County study area is treated as one market area in this analysis. Projected attendance in the study area is proportioned to the project area beaches based upon the total square footage of beach available with and without project conditions. This least density usage approach insures proportional distribution of participation over the study area beaches. If one segment of beach is overcrowded, they all are overcrowded. The opposite is also true. This insures that a participant will find useable beach if it is available in the study area. No attractiveness indexes are used to distribute participation. While it is true that participants may exhibit a preference for a given park because of differences in access and beach facilities available and the more desirable beaches will be occupied first, the avoidance of overcrowding will be the dominant concern. With the authorized plan, additional public beach is created in the study area and excess demand can be accommodated at the various accesses.

TABLE B-18

Allocation of County Demand
Region X (Year 2006)

County	County Residents	(a) County Demand Residents	State Population less County	(b) State Resident Demand	Estimated Tourist	(c) County Demand Tourists	Total (a+b+c)	Adjusted SCORP Demand
Indian River	130,000	656,200	16,913,200	50,700	503,400	1,297,500	1,984,500	2,017,100
Martin	149,300	753,500	16,893,900	50,700	523,700	1,249,200	2,053,400	2,087,100
Palm Beach	1,217,200	6,143,100	15,879,200	762,200	4,530,000	10,160,700	17,066,000	17,346,600
St. Lucie	233,300	1,177,500	16,809,800	453,900	551,400	785,600	2,416,900	2,456,700

As the beaches in the county erode throughout the project life, the allocation of demand to these beaches also changes to reflect the decreased amount of useable beach which varies in the study area under this condition. Likewise, one could expect a different distribution of participation with the proposed improvements which maintain and increase public areas for recreation at the project beaches. The analysis therefore provides a realistic and dynamic analysis of beach usage over time.

RECREATION SUPPLY COMPUTATION

B-18. Without Project - Information defining existing supplies of useable beach areas for Martin County is based upon 1993 aerial photographs. Existing supplies of useable public beach, beach lengths and erosion rates for the authorized project area are shown in Table B-19. Public areas were then eroded from 1993 to the beginning of the project life, in 1996, and then in 10 year increments throughout the 50 year project life. Erosion of public beach area throughout the project life without the proposed project is primarily dependent upon mean high water recession rates. The procedure used to calculate public beach at a given point in time is to multiply the annual mean high water erosion rate by the front footage of the park by the time increment. The area computed is subtracted from the remaining area in the preceding time increment if the beach is receding or added if the beach is accreting. In these areas, the supply of useable beach does not decrease until the bluffline reaches an obstruction which halts bluffline erosion. Without project supplies of useable public beach from 1996 to 2046 for the authorized plam is shown in Table B-20.

B-19. With Project - The total capacity of useable public beach with the plan alternative requires the following computations.

a. The computation of the total area of beaches to be re-nourished. This is dependent upon average project width.

b. The deletion of all privately owned land in the re-nourishment area.

c. The limitation of useable public beach to 1/4 of a mile in either direction from the nearest access point. The 1/4 mile limit is measured from the outlying boundaries of access strips or existing public parks.

d. The addition of all public beach not re-nourished in the study area.

TABLE B-19

MARTIN COUNTY
RECREATIONAL BEACH INFRASTRUCTURE

Full Services Public Beaches/Accesses	DNR #	Beach Length (feet)	M.H.W. Shore Front Wid.(Ft)	1993 Beach Area 1000) Sq. Feet)	1971-1992 Recession Rate (Ft.Per Yr.)
Glasscock/N.County	1	100	181	7,000	-0.7
SeaTurtle	3/4	1,060	170	111,300	-0.8
Jensen	4/5	1,450	154	159,500	-1.2
Bob Graham	9/10	1,900	161	133,300	-1.4
Alex's	12U	580	142	40,600	-1.4
Bryn Mawr	13/14	255	156	17,850	-2.4
Stokes	14/15	55	165	3,025	-1.9
Virginia Forest	16	260	207	15,600	-1.7
Tiger Shores	20	100	194	7,000	-2.2
Stuart	23	1,160	147	58,000	-3.1
End of Modified Project Area					
Fletcher	27	100	201	10,000	0.0
House of Refuge	29	315	142	15,750	-2.9
Chastain	34	100	152	2,000	-0.4
Bath Tub Reef	35	1,125	163	78,750	-6.7
End of Authorized Project Area					
Jupiter Island					
Hobe Sound Nat'l Wildlife Refuge		2,470	50	123,500	-3.4
Hobe Sound County		200	156	31,200	-3.4

NOTE: Recession rates per year are based on 1971-1992 Historical study data.
The area of these beaches will change throughout the project life.

TABLE B-20

MARTIN COUNTY
WITHOUT PROJECT SUPPLY IN (SQFT)

PARKS	RECESSION PER YEAR MHW	ESC	LIM	1992	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	-.7	.0	.0	7127.	6847.	6147.	5447.	4747.	4047.	3347.	100.00
SEA TURTLE	-.8	.0	.0	95663.	92271.	83791.	75311.	66831.	58351.	49871.	1060.00
JENSEN	-1.2	.0	.0	114566.	107606.	90206.	72806.	55406.	38006.	20606.	1450.00
BOB GRAHAM	-1.4	.0	.0	160152.	149512.	122912.	96312.	69712.	43112.	16512.	1900.00
ALEX'S BEACH	-1.4	.0	.0	37641.	34393.	26273.	18153.	10033.	1913.	0.	580.00
BRYN MAWR	-2.4	.0	.0	19331.	16883.	10763.	4643.	0.	0.	0.	255.00
STOKES	-1.9	.0	.0	3354.	2936.	1891.	846.	0.	0.	0.	55.00
VIRGINIA FOREST	-1.7	.0	.0	30041.	28273.	23853.	19433.	15013.	10593.	6173.	260.00
TIGER SHORES	-2.2	.0	.0	9107.	8227.	6027.	3827.	1627.	0.	0.	100.00
STUART	-3.1	.0	.0	62741.	48357.	12397.	0.	0.	0.	0.	1160.00
FLETCHER ACCESS	.0	.0	.0	8879.	8879.	8879.	8879.	8879.	8879.	8879.	100.00
HOUSE/REFUGE PARK	-2.9	.0	.0	15357.	11703.	2568.	0.	0.	0.	0.	[illegible]
CHASTAIN ACCESS	-.4	.0	.0	4641.	4481.	4081.	3681.	3281.	2881.	2481.	100.00
BATH TUB REEF	-6.7	.0	.0	84263.	54113.	0.	0.	0.	0.	0.	1125.00
HOBE SOUND REFUGE	-3.4	.0	.0	123500.	89908.	5928.	0.	0.	0.	0.	2470.00
HOBE SOUND BEACH	-3.4	.0	.0	31200.	28480.	21680.	14880.	8080.	1280.	0.	200.00
TOTAL MARTIN COUNTY				807563.	692869.	427396.	324218.	243609.	169062.	107869.	

The computation of useable public beach for with project for the modified plan is displayed in Table B-21. Square footages are then converted to the number of people per day that the public beach can support. This analysis is done for each park and access strip for each 10 year increment in the project life for the with and without project conditions. A 100 square foot area can support 2 people per day which means the effective public beach area is multiplied by 2 to compute people per day. The results of these calculations are displayed in Tables B-22, B-23.

B-18. Beach Accessibility Parking Constraints - Public beach is useable only if the public has access to it. Accessibility to the beach is determined by the number of public access points available and available parking, different modes of transportation available to the public, and the distance one could reasonably expect a beach participant to walk. Methods of transportation to the beach can be separated into walk-on participants, drive-on participants, and other modes including bicycling. Walk-on participants may be further defined into hotel-tourist participants and single and multi-family walk-on participants. Drive-on participants are defined as automobile and mass-transit participants. Parking constraints for the beach fill alternatives for with and without project are shown in Tables B-24 and B-25.

B-19. Demand Allocation Based Upon Supply - Park participation is derived by dividing the constrained supply of beach area for each park in people per day by the total supply for the study area. These percentages are used to allocate total parking constrained participation. The analysis is done in 10 year increments with and without the beach fill alternatives. The resulting participation is assigned to each park. Without and with project participation, or demand, is illustrated in Tables B-26 and B-27.

TABLE B-21

MARTIN COUNTY
WITH PROJECT SUPPLY IN (SQFT)

MODIFIED PLAN

PARKS	RECESSION PER YEAR MHW	ESC	LIM	1992	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	.0	.0	.0	7127.	18067.	18067.	18067.	18067.	18067.	18067.	100.00
SEA TURTLE	.0	.0	.0	95663.	180108.	180108.	180108.	180108.	180108.	180108.	1060.00
JENSEN	.0	.0	.0	114566.	222801.	222801.	222801.	222801.	222801.	222801.	1450.00
BOB GRAHAM	.0	.0	.0	160152.	305292.	305292.	305292.	305292.	305292.	305292.	1900.00
ALEX'S BEACH	.0	.0	.0	37641.	82321.	82321.	82321.	82321.	82321.	82321.	[illegible].00
BRYN MAWR	.0	.0	.0	19331.	39811.	39811.	39811.	39811.	39811.	39811.	255.00
STOKES	.0	.0	.0	3354.	9084.	9084.	9084.	9084.	9084.	9084.	55.00
VIRGINIA FOREST	.0	.0	.0	30041.	53911.	53911.	53911.	53911.	53911.	53911.	260.00
TIGER SHORES	.0	.0	.0	9107.	19447.	19447.	19447.	19447.	19447.	19447.	100.00
STUART	.0	.0	.0	62741.	170679.	170679.	170679.	170679.	170679.	170679.	1160.00
FLETCHER ACCESS	.0	.0	.0	8879.	20119.	20119.	20119.	20119.	20119.	20119.	100.00
HOUSE/REFUGE PARK	-2.9	.0	.0	15357.	11703.	2568.	0.	0.	0.	0.	315.00
CHASTAIN ACCESS	-.4	.0	.0	4641.	4481.	4081.	3681.	3281.	2881.	2481.	100.00
BATH TUB REEF	-6.7	.0	.0	84263.	54113.	0.	0.	0.	0.	0.	1125.00
HOBE SOUND REFUGE	-3.4	.0	.0	123500.	89908.	5928.	0.	0.	0.	0.	2470.00
HOBE SOUND BEACH	-3.4	.0	.0	31200.	28480.	21680.	14880.	8080.	1280.	0.	200.00
TOTAL MARTIN COUNTY				807563.	1310325.	1155897.	1140201.	1133001.	1125801.	1124121.	

TABLE B-22

MARTIN COUNTY
WITHOUT PROJECT SUPPLY IN (PPD)

PARKS	1992	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	143.	137.	123.	109.	95.	81.	67.	100.00
SEA TURTLE	913.	1845.	1676.	1506.	1337.	1167.	997.	1060.00
JENSEN	2291.	2152.	1804.	1456.	1108.	760.	412.	1450.00
BOB GRAHAM	3203.	2990.	2458.	1926.	1394.	862.	330.	1900.00
ALEX'S BEACH	753.	688.	525.	363.	201.	38.	0.	580.00
BRYN MAWR	387.	338.	215.	93.	0.	0.	0.	255.00
STOKES	67.	59.	38.	17.	0.	0.	0.	55.00
VIRGINIA FOREST	601.	565.	477.	389.	300.	212.	123.	260.00
TIGER SHORES	182.	165.	121.	77.	33.	0.	0.	100.00
STUART	1255.	967.	248.	0.	0.	0.	0.	1160.00
FLETCHER ACCESS	178.	178.	178.	178.	178.	178.	178.	100.00
HOUSE/REFUGE PARK	307.	234.	51.	0.	0.	0.	0.	315.00
CHASTAIN ACCESS	93.	90.	82.	74.	66.	58.	50.	100.00
BATH TUB REEF	1685.	1082.	0.	0.	0.	0.	0.	1125.00
HOBE SOUND REFUGE	2470.	1798.	119.	0.	0.	0.	0.	2470.00
HOBE SOUND BEACH	624.	570.	434.	298.	162.	26.	0.	200.00
TOTAL MARTIN COUNTY	16151.	13857.	8548.	6484.	4872.	3381.	2157.	

TABLE B-23

MARTIN COUNTY
WITH PROJECT SUPPLY IN (PPD)

MODIFIED PLAN

PARKS	1992	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	143.	361.	361.	361.	361.	361.	361.	100.00
SEA TURTLE	1913.	3602.	3602.	3602.	3602.	3602.	3602.	1060.00
JENSEN	2291.	4456.	4456.	4456.	4456.	4456.	4456.	1450.00
BOB GRAHAM	3203.	6106.	6106.	6106.	6106.	6106.	6106.	1900.00
ALEX'S BEACH	753.	1646.	1646.	1646.	1646.	1646.	1646.	580.00
BRYN MAWR	387.	796.	796.	796.	796.	796.	796.	255.00
STOKES	67.	182.	182.	182.	182.	182.	182.	55.00
VIRGINIA FOREST	601.	1078.	1078.	1078.	1078.	1078.	1078.	260.00
TIGER SHORES	182.	389.	389.	389.	389.	389.	389.	100.00
STUART	1255.	3414.	3414.	3414.	3414.	3414.	3414.	1160.00
FLETCHER ACCESS	178.	402.	402.	402.	402.	402.	402.	100.00
HOUSE/REFUGE PARK	307.	234.	51.	0.	0.	0.	0.	315.00
CHASTAIN ACCESS	93.	90.	82.	74.	66.	58.	50.	100.00
BATH TUB REEF	1685.	1082.	0.	0.	0.	0.	0.	1125.00
HOBE SOUND REFUGE	2470.	1798.	119.	0.	0.	0.	0.	2470.00
HOBE SOUND BEACH	624.	570.	434.	298.	162.	26.	0.	200.00
TOTAL MARTIN COUNTY	16151.	26207.	23118.	22804.	22660.	22516.	22482.	

TABLE B-24

MARTIN COUNTY
WITHOUT PROJECT SUPPLY IN (PPD)
PARKING CONSTRAINTS

PARKS	1992	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	264.	264.	264.	264.	264.	264.	264.	100.00
SEA TURTLE	720.	720.	720.	720.	720.	720.	720.	1060.00
JENSEN	1920.	1920.	1920.	1920.	1920.	1920.	1920.	1450.00
BOB GRAHAM	240.	240.	240.	240.	240.	240.	240.	1900.00
ALEX'S BEACH	1200.	1200.	1200.	1200.	1200.	1200.	1200.	580.00
BRYN MAWR	160.	160.	160.	160.	160.	160.	160.	255.00
STOKES	80.	80.	80.	80.	80.	80.	80.	55.00
VIRGINIA FOREST	176.	176.	176.	176.	176.	176.	176.	260.00
TIGER SHORES	208.	208.	208.	208.	208.	208.	208.	100.00
STUART	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1160.00
FLETCHER ACCESS	96.	96.	96.	96.	96.	96.	96.	100.00
HOUSE/REFUGE PARK	256.	256.	256.	256.	256.	256.	256.	315.00
CHASTAIN ACCESS	240.	240.	240.	240.	240.	240.	240.	100.00
BATH TUB REEF	1104.	1104.	1104.	1104.	1104.	1104.	1104.	1125.00
HOBE SOUND REFUGE	696.	696.	696.	696.	696.	696.	696.	2470.00
HOBE SOUND BEACH	720.	720.	720.	720.	720.	720.	720.	200.00
TOTAL MARTIN COUNTY	9240.	9240.	9240.	9240.	9240.	9240.	9240.	

TABLE B-25

MARTIN COUNTY
WITH PROJECT SUPPLY IN (PPD)
PARKING CONSTRAINTS

MODIFIED PLAN

PARKS	1992	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	264.	264.	264.	264.	264.	264.	264.	100.00
SEA TURTLE	720.	720.	720.	720.	720.	720.	720.	1060.00
JENSEN	1920.	1920.	1920.	1920.	1920.	1920.	1920.	1450.00
BOB GRAHAM	240.	240.	240.	240.	240.	240.	240.	1900.00
ALEX'S BEACH	1200.	1200.	1200.	1200.	1200.	1200.	1200.	580.00
BRYN MAWR	160.	160.	160.	160.	160.	160.	160.	255.00
STOKES	80.	80.	80.	80.	80.	80.	80.	55.00
VIRGINIA FOREST	176.	176.	176.	176.	176.	176.	176.	260.00
TIGER SHORES	208.	208.	208.	208.	208.	208.	208.	100.00
STUART	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1160.00
FLETCHER ACCESS	96.	96.	96.	96.	96.	96.	96.	100.00
HOUSE/REFUGE PARK	256.	256.	256.	256.	256.	256.	256.	315.00
CHASTAIN ACCESS	240.	240.	240.	240.	240.	240.	240.	100.00
BATH TUB REEF	1104.	1104.	1104.	1104.	1104.	1104.	1104.	1125.00
HOBE SOUND REFUGE	696.	696.	696.	696.	696.	696.	696.	2470.00
HOBE SOUND BEACH	720.	720.	720.	720.	720.	720.	720.	200.00
TOTAL MARTIN COUNTY	9240.	9240.	9240.	9240.	9240.	9240.	9240.	

TABLE B-26

MARTIN COUNTY
WITHOUT PROJECT DEMAND
IN YEARLY USER OCCASIONS

PARKS	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	28996.	51984.	71819.	89781.	108563.	123264.	100.00
SEA TURTLE	152456.	304444.	474660.	680875.	965723.	1325810.	1060.00
JENSEN	406551.	762852.	959947.	1047905.	1019535.	758879.	1450.00
BOB GRAHAM	50819.	101481.	158220.	226958.	321908.	441937.	1900.00
ALEX'S BEACH	145651.	222185.	239347.	189756.	51317.	0.	580.00
BRYN MAWR	33879.	67654.	61218.	0.	0.	0.	255.00
STOKES	12434.	15992.	11155.	0.	0.	0.	55.00
VIRGINIA FOREST	37267.	74420.	116028.	166436.	236066.	227340.	260.00
TIGER SHORES	34841.	50969.	50459.	30772.	0.	0.	100.00
STUART	204787.	104839.	0.	0.	0.	0.	1160.00
FLETCHER ACCESS	20328.	40593.	63288.	90783.	128763.	176775.	100.00
HOUSE/REFUGE PARK	49561.	21717.	0.	0.	0.	0.	315.00
CHASTAIN ACCESS	18977.	34512.	48534.	62054.	77285.	91370.	100.00
BATH TUB REEF	229163.	0.	0.	0.	0.	0.	1125.00
HOBE SOUND REFUGE	147375.	50132.	0.	0.	0.	0.	2470.00
HOBE SOUND BEACH	120610.	183343.	196193.	152819.	34337.	0.	200.00
TOTAL MARTIN COUNTY	1693694.	2087115.	2450866.	2738140.	2943497.	3145374.	

TABLE B-27

MARTIN COUNTY
WITH PROJECT DEMAND
IN YEARLY USER OCCASIONS

MODIFIED PLAN

PARKS	1996	2006	2016	2026	2036	2046	FF
GLASSCOCK	50265.	79749.	98106.	112052.	123205.	132360.	100.00
SEA TURTLE	137087.	217498.	267561.	305595.	336015.	360983.	1060.00
JENSEN	365564.	579994.	713496.	814920.	896039.	962621.	1450.00
BOB GRAHAM	45696.	72499.	89187.	101865.	112005.	120328.	1900.00
ALEX'S BEACH	228478.	362496.	445935.	509325.	560024.	601638.	580.00
BRYN MAWR	30464.	48333.	59458.	67910.	74670.	80218.	255.00
STOKES	15232.	24166.	29729.	33955.	37335.	40109.	55.00
VIRGINIA FOREST	33510.	53166.	65404.	74701.	82137.	88240.	260.00
TIGER SHORES	39603.	62833.	77295.	88283.	97071.	104284.	100.00
STUART	220862.	350413.	431070.	492348.	541357.	581584.	1160.00
FLETCHER ACCESS	18278.	29000.	35675.	40746.	44802.	48131.	100.00
HOUSE/REFUGE PARK	44565.	15515.	0.	0.	0.	0.	315.00
CHASTAIN ACCESS	17063.	24656.	27358.	27852.	26891.	24878.	100.00
BATH TUB REEF	206060.	0.	0.	0.	0.	0.	1125.00
HOBE SOUND REFUGE	132517.	35815.	0.	0.	0.	0.	2470.00
HOBE SOUND BEACH	108451.	130982.	110592.	68589.	11947.	0.	200.00
TOTAL MARTIN COUNTY	1693694.	2087115.	2450866.	2738140.	2943497.	3145374.	

B-20. Daily Demand - Historical patterns of beach use along the coast of Florida are characterized by user groups. These groups define how annual participation occurs within a given year. Daily attendance within the year reflects the climate or season which affects monthly participation. Daily attendance is also influenced by weekdays and weekends.

User groups were derived by ranking attendance records in descending order. Each day's attendance was divided by the attendance for the year to determine the percentage of yearly participation attributable to that day. To reduce the number of groups and simplify the computational process, groups with similar percentages were averaged. The net result was nineteen user groups representing 365 days in the year. These user groups are shown in Table B-28.

TABLE B-28

MARTIN BEACH COUNT 1984

A Rank	B No. Days In Group	C Average Daily Attendance	D Average Daily % of Total (In %)
1	1	11,000.00	3.544
2	1	9,500.00	3.061
3	1	5,000.00	1.611
4	1	4,500.00	1.450
5	3	4,000.00	1.289
6	3	3,500.00	1.128
7	1	3,100.00	0.999
8	8	2,993.75	0.965
9	4	2,500.00	0.806
10	1	2,250.00	0.725
Subtotal	(24[1])		
11	25	2,004.00	0.646
12	3	1,800.00	0.580
13	6	1,466.67	0.473
14	18	1,194.44	0.385
15	35	975.71	0.314
16	40	771.25	0.249
17	71	539.08	0.174
18	58	330.17	0.106
19	85	121.35	0.039
Total	365		

[1]The 24 days including those groups marked 1 through 10 represent peak daily demand for beach use.

DETERMINATION OF WILLINGNESS TO PAY - TRAVEL COST METHOD

B-21. The travel cost method was used to determine the value of a beach visit. The basic premise of the traval cost method (TCM) is that the per capita use of a recreation site will decrease as the out-of-pocket and time cost of traveling from place of roigin to site increases. The value of a beach visit is determined by dividing the area under the cost of Travel versus Beach Activity Demand Curve by the total annual demand. The procedures which comprise the analysis are listed below and discussed in the following paragraphs.

a. Considering the Martin County coast as mile 0, establish 2-mile-wide origin zones that lie equal distance to the coast.
b. Establish population of each zone by use of 1990 census data.
c. Establish per capita beach use rate in each zone.
d. Establish mean round trip distance for each zone and establish a per capita use relationship (per capita participation rate versus mean round trip travel distance).
e. Compute travel and opportunity costs per person for each zone for a given trip.
f. Adjust travel and opportunity costs for round trip distance and compute "e" on a per mile basis for each zone.
g. Average the values in each zone computed in "f" and equate to a price per person per mile.
h. Calculate total demand from all zones as points on price-demand curve where price equal 0.0.
i. Simulate moving the Martin County (Hutchinson Island) ocean coast seaward using 2, mile increments up to 22 miles.
j. For each simulation estimate per capita participation from the per capita use relationship and compute estimated demand for each zone.
k. For each simulation plot price versus demand on a composite demand curve.
l. Estimate value of a beach visit by dividing the area under the curve enveloped by step i, j, and k by the total demand.

B-22. Origin Zones. Selection of the origin zones was based on the unique geography of the study area in which Martin County is located. An area with a radius of 22 miles was selected from a center point of the shorefront on Hutchinson Island and measured in 2-miles increments and identified by subzones as Inner(I), Middle (M), and Outer (O) and to keep the one way travel time within 1/2 hour in keeping with day users. In addition to Martin County, major portions of Indian River, St. Lucie, Okeechobee, Palm Beach, (all though small, Highlands and Glades) Counties are included in this area.

Considering the Martin County ocean beach area as mile 0, four 2-mile-wide zones lying equidistant to the nearest beach area were plotted on a large scale county map. The equidistance of the zones was maintained by drawing circles whose radius increased by 2-mile increments. The circles originate from the ocean beach area fronting the most direct access route from the mainland to Hutchinson and Jupiter islands and beaches. These access routes consists of the causeways to the islands. For better population grouping definition, each of the 2-mile-wide zones was subdivided into subzones which correspond to the Inner, Middle, and Outer with respect to location within the zone.

Population in each zone was tabulated based on 1990 census tract county maps. Tract numbers were identified and located on county road maps for Martin, St. Lucie, and Palm Beach counties. The methodology used to establish population groupings was as follows:

a. The tract numbers were identified and located on the master map.
b. Census data from Bureau of Economic Analysis were use to locate population by tract number.
c. A compilation was made for each major zone. The tract population for each zone code was established. The compilation is summarized in Table B-29.

B-23. Zone Per Capita Use Rate. The average participation rates from the 1985 report were used along with the 1990 census tract population to calculate the number of people residing in each subzone and expected participation. Total population and participation for the study area were also calculated. Table B-29 displays those data.

B-24. Travel Distance Computation - Travel distance is of paramount importance when using the travel cost method as a proxy for willingness to pay for a beach visit. The utilization of zones allows the determination of a mean weighted average travel distance (MWATD). The MWATD for each zone was calculated by first taking the distance from the centroid of each participation block and multiplying it by the blocks population. The number thus obtained for each block was summated for each zone and this cumulative value was divided by the total zone population to obtain the MWATD. These distances in miles, are shown in Table B-29.

TABLE B-29

BEACH PARTICIPATION ZONE CHARACTERISTICS

ZONE	Distan (Miles	Subzone	1990 SUBZONE Pop.	ZONE POP.	Zone Parti. Rate	Wgt.Avg. Rate	Estimated Visits	MWATD (Oneway)	MWATD (Roundtrip)
A	2	1 Inner	2,136		5.06			1.00	
	4	1 Middle	13,285	15,421	5.00	5.01	77,259	3.00	8.5
B	6	1 Outer	29,633	29,633	4.03	4.03	119,421	6.00	13.0
	8	2 Inner	17,826		2.56			7.30	
	10	2 Middle	31,130		2.98			9.40	
C	12	2 Outer	26,710		3.80			11.20	
	14	3 Inner	20,789		4.20			13.00	
	16	3 Middle	10,267		4.20			15.00	
	18	3 Outer	19,347		4.20			17.00	
	22	4 Middle	42,479	168,548	2.24	3.24	546,096	21.00	30.8
TOTAL							742,776		

A per capita utilization curve which relates per capita participation and travel distance was created by drawing a smooth curve through the average participation rates computed for the four zones and their respective mean weighted round trip travel distances. A round trip travel distance of 30.8 miles was determined as the point where no further day beach use could be expected.

The cost of travel is comprised of the out-of-pocket travel cost and the opportunity cost of time. The travel cost per mile is determined as an average variable cost per mile. Costs of travel were re-evaluated in this study using costs which were extracted from the 1993 Edition of the American Automobile Association (AAA) Your Driving Costs. These costs are summarized in Table B-30.

TABLE B-30

AVERAGE VARIABLE COST TO OPERATE AN AUTOMOBILE
(Cents per mile)

1990 Variable Cost	Large	Intermediate	Compact	Average
Maintenance, Accessories, Parts and Tires	0.035	0.033	0.029	0.033
Gasoline and Oil	0.7	0.06	0.048	0.059
Total	0.105	0.093	0.077	0.092

The Opportunity cost of time is valued as one-third of the average hourly wage rate for adults and one-twelfth of the adult wage rate for children. The 1993 average rate of $10.04 was derived from information published in the 1993 Florida Statistical Abstract for the state of Florida. Using the methodology shown in the December 1979 Principles and Standards, the adult's opportunity cost of time is $3.35 (10.04/3) and the children's opportunity cost of time is $0.84 cents (10.04/12. In this report, each automobile is occupied by four persons; considering a population comprised of 22 percent children and 78 percent adults, (1993 Florida Statistical Abstract) the average occupance of each automobile would be comprised of 3.12 adult and .88 children. The weighted opportunity cost of time per hour per visitor would be $2.79 and would be computed as follows:

$$\frac{(.88 \times \$.84) + (3.12 \times \$3.35)}{4} = \$2.79$$

The total cost of travel per beach visitor from the previously established origin zones is summarized by the following equation:

Total Cost of Travel = Out-of-Pocket Cost + Opportunity Cost of time
where,

$$\text{Out-of-Pocket Cost} = \frac{D \times CM}{4;}$$

$$\text{Opportunity Cost of Time} = \frac{D \times CH}{4; \text{ and}}$$

D = total distance; CM = Cost per mile; CH = cost per hour

V = velocity; 4 = number of person per vehicle

B-25. Average Value of Travel. Values utilized for the overall trip cost, which include travel cost and opportunity cost of time were converted to a price per person per mile for each zone by dividing the trip cost per person by the mean weighted average round trip distance in that zone. Table B-31 illustrates the data used to determine the average cost (value) of travel. Price per person per mile computed for the zones are also shown in Table B-35. The difference in these values is mainly attributable to different travel times reflected in opportunity cost. Notice that 1 mile has been added to the commuting distance to allow for parking.

TABLE B-31

PER TRIP COSTS

zone	Round Trip MWATD (MI)	Parking (Plus) 1 Mile	Variable Auto[2] ($)	Time[3] (Hrs)	Time Value[4] ($)	Total ($)	Trip Cost Person ($)	Log 10 Cents Per Person ($)
A	8.5	9.5	.87	.271	3.02	3.89	.97	1.987
B	13.0	14.0	1.29	.400	4.46	5.75	1.44	2.158
C	30.8	31.8	2.93	.909	10.14	13.07	3.27	2.515

[2] $.092xMI.

[3] MWATD/35 mph Average.

[4] 4x $2.79 x Time(hrs).

B-26. Value of Recreation - The travel cost method requires the analysis of small incremental increases in the price of participation to measure the quantity of use that would be demanded given these changes. This is equivalent to moving the project farther and farther from the potential users, requiring them to pay more and more in travel cost. It estimated that the average one way distance participants will travel to participate in beach activities is approximately 50 miles.

Estimated visitation was computed by multiplying the population of each zone by an appropriate participation rate from the per-capita utilization curve. The results were summed and entered as a line item in Table B-31. Costs were determined by computing a relationship between round trip travel distance which includes parking distance and the total trip cost per person shown in Table B-35. A demand curve which relates the expected visitation at varying price levels was plotted using information in Table B-36. The area under the curve represented the total value of the visits to the entire sample area. The computed value of these visits is $1,810,350. The average value per visit is computed by dividing this value by the total number of visits in the sample area (742,800). The average value per visit is $2.44, which will be used in the remaining analysis. The average cost per mile is computed to be $0.092 per mile as indicated in table B-30

TABLE B-32

TRAVEL COST DEMAND CURVE POINTS

Additional Cost	Estimated Visitation
0.00	742,800
0.50	538,500
1.00	467,900
1.50	407,300
2.00	354,200
2.50	306,800
3.00	263,800
3.50	224,600
4.00	188,700
4.50	155,200
5.00	124,000
5.50	94,900
6.00	67,400
6.50	41,500
7.00	20,300
7.50	14,600
8.00	9,200
9.00	700
10.00	0

Area under demand curve = 1,522,712, thus;

Value Per Visit = $\frac{\$1,810,350}{742,800}$ = $2.44 (per visit)
Visit in Sample area(Table B-33)

RECREATION DEMAND COMPUTATION

B-27. Method - Recreation benefits have been computed for each 10 year increment in the project life for the authorized and recommended plans. The procedure used to compute project benefits is shown in Tables B-33 the Martin County Market Area. The "Group Daily % of Total" column is the user group percentage of total annual demand attributable to a user group. Column 2 indicates the current participation which can be expected to be satisfied by the area of the beach without the project for a given user day. This is calculated by multiplying yearly participation without the project by the user day percentage. The result is total demand for this user group per day expressed as people per day. If this result is larger than the without

project condition supply in people per day, then the smaller value is entered and the remaining demand is unsatisfied. The unsatisfied demand for the group multiplied by the number of days in the group is entered in column 3. This value indicates in people per days the extent of overcrowding in the user group. Negative numbers indicate excess capacity.

The total participation for each group in people per day is displayed in column 4. This is determined by multiplying column 2 by the number of days. The number of participants in column 4 is multiplied by the value of a use visit to derive the total value of user visits without the project for a given group (column 6).

This procedure is also done with the authorized plan using with project supply and demand values. The difference between the without project and with project value of user visits is the benefit for a given user day group. The sum of the benefits computed for each user group is the annual recreational benefit attributable to the area in a specific year for a given alternative.

B-28. Computational Observations - On any given day in the project life, participation is allocated so that the density of usage is the same at all parks in the project area. A useful indicator of density is the constrained daily total participation expected per day divided by the useful supply of beach in people per day. When this demand-supply ratio (D/S) > 1, there is overcrowding and excess demand. When, D/S < 1, all demand is satisfied and extra capacity exists. The Modified Plan increases useable beach area and decreases beach density so that on any given day, D/S with the project, (D/S(WP)), is less than D/S without the project (D/S(WO)). Whenever D/S(WO) > 1, all or part of a benefit for the reduction of overcrowding is claimed depending upon whether D/S(WP) is less than or greater than 1. In addition, satisfied demand without the project may move to the project beaches also seeking least density whenever D/S(WP) < 1. In the extreme case when D/S(WO) < 1 and D/S(WP) < D/S(WO), all participants have achieved minimum satisfaction without the project. In this case, there is no net benefit since willingness to pay does not vary among beaches in the project area. Therefore, negative benefits may occur at unimproved beaches which experience a decline in participation with a given plan. However, this decline is compensated for at other beaches.

Average Annual Benefits - Average annual benefits are displayed for the Martin County market area in 10 year increments. These benefits are amortized and discounted at 8 percent. Amortized benefits and average annual equivalent benefits are displays in Table B-34.

TABLE B-33

MARTIN COUNTY
CURRENT YEAR= 2006

GROUP DAILY % OF TOTAL	CURRENT (WO) PARTICIPATION (U)	XTRA DEMAND (WO)	TOTAL PART.	NO. DAYS	TOTAL WITHOUT VALUE	CURRENT (WP) PARTICIPATION (PA)	PA(DAYS) W(DAYS)	TOTAL WITH VALUE	TOTAL BENEFIT	XTRA DEMAND (WP)
3.54	4935.96	69031.	4935.96	1.	12043.74	6909.14	6909.14	16858.30	4814.56	67058.
3.06	4935.96	58951.	4935.96	1.	12043.74	6909.14	6909.14	16858.30	4814.56	56977.
1.61	4935.96	28687.	4935.96	1.	12043.74	6909.14	6909.14	16858.30	4814.56	26714.
1.45	4935.96	25327.	4935.96	1.	12043.74	6909.14	6909.14	16858.30	4814.56	23354.
1.29	4935.96	65901.	14807.88	3.	36131.23	6909.14	20727.42	50574.91	14443.68	59981.
1.13	4935.96	55820.	14807.88	3.	36131.23	6909.14	20727.42	50574.91	14443.68	49901.
1.00	4935.96	15914.	4935.96	1.	12043.74	6909.14	6909.14	16858.30	4814.56	13941.
.96	4935.96	121638.	39487.68	8.	96349.95	6909.14	55273.12	134866.40	38516.46	105852.
.81	4935.96	47545.	19743.84	4.	48174.98	6909.14	27636.56	67433.21	19258.23	39652.
.73	4935.96	10196.	4935.96	1.	12043.74	6909.14	6909.14	16858.30	4814.56	8222.
.65	4935.96	213670.	123399.00	25.	301093.60	6909.14	172728.50	421457.60	120364.00	164341.
.58	4935.96	21508.	14807.88	3.	36131.23	6909.14	20727.42	50574.91	14443.68	15588.
.47	4935.96	29617.	29615.76	6.	72262.46	6909.14	41454.84	101149.80	28887.35	17777.
.38	4935.96	55790.	88847.29	18.	216787.40	6909.14	124364.50	303449.40	86662.05	20273.
.31	4935.96	56615.	172758.60	35.	421531.00	6553.54	229374.00	559672.40	138141.40	-12446.
.25	4935.96	10438.	197438.40	40.	481749.80	5196.92	207876.70	507219.10	25469.31	-68489.
.17	3631.58	-92611.	257842.20	71.	629134.90	3631.58	257842.20	629134.90	.01	-232707.
.11	2212.34	-157970.	128315.80	58.	313090.60	2212.34	128315.80	313090.60	-.01	-272414.
.04	813.97	-350369.	69187.86	85.	168818.40	813.97	69187.86	168818.40	.01	-518089.
			1200676.00		2929650.00		1417691.00	3459167.00	529517.20	

NOTES:

W/O PROJECT CAPACITY	(C)	=	4936.
WITH PROJECT CAPACITY	(W)	=	6909.
YEARLY PARTICIPATION	(WO)	=	2087115.
YEARLY PARTICIPATION	(WP)	=	2087115.
USER DAY VALUE		=	2.44
YEARLY UNSATISFIED DEMAND	(WO)	=	886648.
YEARLY UNSATISFIED DEMAND	(WP)	=	669633.

TABLE B-34

MARTIN COUNTY
AVERAGE ANNUAL BENEFIT SUMMARY
INDIVIDUAL PARK ANALYSIS @ 8.000 %

PARKS	1996	2006	2016	2026	2036	2046	AVG ANN
GLASSCOCK	43387.89	59206.83	71975.52	84792.05	98775.18	112024.50	61502.27
SEA TURTLE	-19685.51	-66863.88	-97146.65	-119021.60	-125868.40	-141703.00	-66866.98
JENSEN	-52494.69	-109525.20	62828.08	299386.70	582617.40	876898.30	12596.47
BOB GRAHAM	-6561.84	-22287.96	-32382.21	-39673.88	-41956.14	-47234.32	-22288.99
ALEX'S BEACH	171167.80	288921.10	418840.70	560819.90	709958.30	762400.90	325359.10
BRYN MAWR	-4374.56	-14858.64	25000.23	95101.27	98699.79	101653.50	10725.55
STOKES	6288.20	17605.85	32977.07	47550.63	49349.89	50826.73	21468.42
VIRGINIA FOREST	-4812.02	-16344.50	-23746.96	-29094.17	-30767.84	9082.33	-15807.54
TIGER SHORES	11622.48	32594.06	63155.36	98911.30	128309.70	132149.50	42982.36
STUART	45097.44	433611.40	648408.70	689484.10	715573.40	736987.60	400556.70
FLETCHER ACCESS	-2624.73	-8915.18	-12952.88	-15869.55	-16782.46	-18893.73	-8915.60
HOUSE/REFUGE PARK	-6399.43	-4769.62	.00	.00	.00	.00	-3696.11
CHASTAIN ACCESS	-2450.30	-7579.77	-9933.24	-10847.50	-10072.97	-9765.70	-6974.15
BATH TUB REEF	-29590.05	.00	.00	.00	.00	.00	-8323.95
HOBE SOUND REFUGE	-19029.33	-11010.25	.00	.00	.00	.00	-9729.61
HOBE SOUND BEACH	-15573.41	-40266.91	-40153.95	-26713.74	-4475.32	.00	-30234.68
TOTAL MARTIN COUNTY	113968.00	529517.40	1106870.00	1634826.00	2153361.00	2564427.00	702353.20

SUMMARY OF TOTAL PROJECT BENEFITS AND COSTS

B-29. The share protection project for Martin County, Florida, will provide both storm-damage reduction and recreation benefits. As discussed previously. both types of benefits have been evaluated on an average annual equivalent basis for a 50-year period of analysis and an interest rate of 8 percent. Comparison of those benefits with project costs on the same annual basis provides an indication of the economic feasibility of the project and an estimate of its net contribution to the objective of national economic development. Table B-35 summarizes total project costs and benefits, the benefit-to-cost ratio, and net annual benefits. As shown in the table, the project is economically justified with a benefit-to-cost ratio of 5.0:1 and would provide net annual benefits estimated at $4,532,200.

TABLE B-35

SUMMARY OF COSTS AND BENEFITS
8.00 PERCENT INTEREST RATE

PROJECT COST	
Total First Cost (Construction)	$10,491,400
Interest During Construction	396,400
TOTAL INVESTMENT COST	$10,887,800
Annual Investment Cost	890,000
Future Renourishment (O&M)	252,000
TOTAL ANNUAL COST	$ 1,142,000
PROJECT BENEFITS	
Storm Damage Reduction	$ 4,971,800
Recreation	702,400
TOTAL ANNUAL BENEFITS	$ 5,674,200
BENEFIT:COST RATIO	5.0:1
NET ANNUAL BENEFITS	$ 4,532,200

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** PROJECT OWNER SUMMARY - LEVEL 1 (Rounded to 100's) **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
01	Contract 01 - 1,297,500 CY		8,186,600	1,548,800	9,735,500	
02	Contract 02 - Monitoring		180,600	36,100	216,700	
03	Contract 03 - Monitoring		180,600	36,100	216,700	
04	Contract 04 - Monitoring		180,600	36,100	216,700	
05	Contract 05 - Monitoring		180,600	36,100	216,700	
06	Contract 06 - Monitoring		180,600	36,100	216,700	
07	Contract 07 - 589,600 CY		3,495,000	699,000	4,194,000	
08	Contract 08 - 589,600 CY		3,495,000	699,000	4,194,000	
09	Contract 09 - 589,600 CY		3,495,000	699,000	4,194,000	
10	Contract 10 - 589,600 CY		3,495,000	699,000	4,194,000	
	Martin County, Florida		23,069,600	4,525,400	27,595,100	

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** PROJECT OWNER SUMMARY - LEVEL 2 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
01 Contract 01 - 1,297,500 CY					
01- A Construction Cost		6,393,600	1,278,700	7,672,400	
01- B Non-Construction Cost		1,793,000	270,100	2,063,100	
Contract 01 - 1,297,500 CY		8,186,600	1,548,800	9,735,500	
02 Contract 02 - Monitoring					
02- A Construction Cost		157,000	31,400	188,400	
02- B Non-Construction Cost		23,600	4,700	28,300	
Contract 02 - Monitoring		180,600	36,100	216,700	
03 Contract 03 - Monitoring					
03- A Construction Cost		157,000	31,400	188,400	
03- B Non-Construction Cost		23,600	4,700	28,300	
Contract 03 - Monitoring		180,600	36,100	216,700	
04 Contract 04 - Monitoring					
04- A Construction Cost		157,000	31,400	188,400	
04- B Non-Construction Cost		23,600	4,700	28,300	
Contract 04 - Monitoring		180,600	36,100	216,700	
05 Contract 05 - Monitoring					
05- A Construction Cost		157,000	31,400	188,400	
05- B Non-Construction Cost		23,600	4,700	28,300	
Contract 05 - Monitoring		180,600	36,100	216,700	
06 Contract 06 - Monitoring					
06- A Construction Cost		157,000	31,400	188,400	
06- B Non-Construction Cost		23,600	4,700	28,300	
Contract 06 - Monitoring		180,600	36,100	216,700	
07 Contract 07 - 589,600 CY					
07- A Construction Cost		3,039,000	607,800	3,646,800	

** PROJECT OWNER SUMMARY - LEVEL 2 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
07- B Non-Construction Cost		456,000	91,200	547,200	
Contract 07 - 589,600 CY		3,495,000	699,000	4,194,000	
08 Contract 08 - 589,600 CY					
08- A Construction Cost		3,039,000	607,800	3,646,800	
08- B Non-Construction Cost		456,000	91,200	547,200	
Contract 08 - 589,600 CY		3,495,000	699,000	4,194,000	
09 Contract 09 - 589,600 CY					
09- A Construction Cost		3,039,000	607,800	3,646,800	
09- B Non-Construction Cost		456,000	91,200	547,200	
Contract 09 - 589,600 CY		3,495,000	699,000	4,194,000	
10 Contract 10 - 589,600 CY					
10- A Construction Cost		3,039,000	607,800	3,646,800	
10- B Non-Construction Cost		456,000	91,200	547,200	
Contract 10 - 589,600 CY		3,495,000	699,000	4,194,000	
Martin County, Florida		23,069,600	4,525,400	27,595,100	

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** PROJECT OWNER SUMMARY - LEVEL 6 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
01 Contract 01 - 1,297,500 CY					
01- A Construction Cost					
01- A/06 Fish and Wildlife Facilities					
01- A/06.03 Wildlife Facilities & Sanctuary					
01- A/06.03.73 Habitat and Feeding Facilities					
01- A/06.03.73/01 Monitoring		128,000	25,600	153,600	
Habitat and Feeding Facilities		128,000	25,600	153,600	
Wildlife Facilities & Sanctuary		128,000	25,600	153,600	
Fish and Wildlife Facilities		128,000	25,600	153,600	
01- A/17 Beach Replenishment					
01- A/17.00 Beach Replenishment					
01- A/17.00.01 Mob, Demob & Preparatory Work					
01- A/17.00.01/01 Mob, Demob & Preparatory Work		1,400,000	280,000	1,680,000	
Mob, Demob & Preparatory Work		1,400,000	280,000	1,680,000	
01- A/17.00.16 Pipeline Dredging					
01- A/17.00.16/01 Pipeline Dredging	1297500 CY	4,865,600	973,100	5,838,800	4.50
Pipeline Dredging		4,865,600	973,100	5,838,800	
Beach Replenishment		6,265,600	1,253,100	7,518,800	
Beach Replenishment		6,265,600	1,253,100	7,518,800	
Construction Cost		6,393,600	1,278,700	7,672,400	
01- B Non-Construction Cost					
01- B/01 Lands and Damages					
Lands and Damages		314,000	78,500	392,500	
01- B/30 Planning, Engineering and Design					

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
Planning, Engineering and Design		1,031,000	102,000	1,133,000	
01- B/31 Construction Management (S&I)					
Construction Management (S&I)		448,000	89,600	537,600	
Non-Construction Cost		1,793,000	270,100	2,063,100	
Contract 01 - 1,297,500 CY		8,186,600	1,548,800	9,735,500	
02 Contract 02 - Monitoring					
02- A Construction Cost					
02- A/06 Fish and Wildlife Facilities					
02- A/06.03 Wildlife Facilities & Sanctuary					
02- A/06.03.73 Habitat and Feeding Facilities					
02- A/06.03.73/01 Monitoring		157,000	31,400	188,400	
Habitat and Feeding Facilities		157,000	31,400	188,400	
Wildlife Facilities & Sanctuary		157,000	31,400	188,400	
Fish and Wildlife Facilities		157,000	31,400	188,400	
Construction Cost		157,000	31,400	188,400	
02- B Non-Construction Cost					
02- B/30 Planning, Engineering and Design					
Planning, Engineering and Design		12,600	2,500	15,100	
02- B/31 Construction Management (S&I)					
Construction Management (S&I)		11,000	2,200	13,200	
Non-Construction Cost		23,600	4,700	28,300	
Contract 02 - Monitoring		180,600	36,100	216,700	
03 Contract 03 - Monitoring					

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** PROJECT OWNER SUMMARY - LEVEL 6 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
03- A Construction Cost					
03- A/06 Fish and Wildlife Facilities					
03- A/06.03 Wildlife Facilities & Sanctuary					
03- A/06.03.73 Habitat and Feeding Facilities					
03- A/06.03.73/01 Monitoring		157,000	31,400	188,400	
Habitat and Feeding Facilities		157,000	31,400	188,400	
Wildlife Facilities & Sanctuary		157,000	31,400	188,400	
Fish and Wildlife Facilities		157,000	31,400	188,400	
Construction Cost		157,000	31,400	188,400	
03- B Non-Construction Cost					
03- B/30 Planning, Engineering and Design					
Planning, Engineering and Design		12,600	2,500	15,100	
03- B/31 Construction Management (S&I)					
Construction Management (S&I)		11,000	2,200	13,200	
Non-Construction Cost		23,600	4,700	28,300	
Contract 03 - Monitoring		180,600	36,100	216,700	
04 Contract 04 - Monitoring					
04- A Construction Cost					
04- A/06 Fish and Wildlife Facilities					
04- A/06.03 Wildlife Facilities & Sanctuary					
04- A/06.03.73 Habitat and Feeding Facilities					
04- A/06.03.73/01 Monitoring		157,000	31,400	188,400	
Habitat and Feeding Facilities		157,000	31,400	188,400	

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
Wildlife Facilities & Sanctuary		157,000	31,400	188,400	
Fish and Wildlife Facilities		157,000	31,400	188,400	
Construction Cost		157,000	31,400	188,400	
04- B Non-Construction Cost					
04- B/30 Planning, Engineering and Design					
Planning, Engineering and Design		12,600	2,500	15,100	
04- B/31 Construction Management (S&I)					
Construction Management (S&I)		11,000	2,200	13,200	
Non-Construction Cost		23,600	4,700	28,300	
Contract 04 - Monitoring		180,600	36,100	216,700	
05 Contract 05 - Monitoring					
05- A Construction Cost					
05- A/06 Fish and Wildlife Facilities					
05- A/06.03 Wildlife Facilities & Sanctuary					
05- A/06.03.73 Habitat and Feeding Facilities					
05- A/06.03.73/01 Monitoring		157,000	31,400	188,400	
Habitat and Feeding Facilities		157,000	31,400	188,400	
Wildlife Facilities & Sanctuary		157,000	31,400	188,400	
Fish and Wildlife Facilities		157,000	31,400	188,400	
Construction Cost		157,000	31,400	188,400	
05- B Non-Construction Cost					
05- B/30 Planning, Engineering and Design					
Planning, Engineering and Design		12,600	2,500	15,100	

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** PROJECT OWNER SUMMARY - LEVEL 6 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
05- B/31 Construction Management (S&I)					
Construction Management (S&I)		11,000	2,200	13,200	
Non-Construction Cost		23,600	4,700	28,300	
Contract 05 - Monitoring		180,600	36,100	216,700	
06 Contract 06 - Monitoring					
06- A Construction Cost					
06- A/06 Fish and Wildlife Facilities					
06- A/06.03 Wildlife Facilities & Sanctuary					
06- A/06.03.73 Habitat and Feeding Facilities					
06- A/06.03.73/01 Monitoring		157,000	31,400	188,400	
Habitat and Feeding Facilities		157,000	31,400	188,400	
Wildlife Facilities & Sanctuary		157,000	31,400	188,400	
Fish and Wildlife Facilities		157,000	31,400	188,400	
Construction Cost		157,000	31,400	188,400	
06- B Non-Construction Cost					
06- B/30 Planning, Engineering and Design					
Planning, Engineering and Design		12,600	2,500	15,100	
06- B/31 Construction Management (S&I)					
Construction Management (S&I)		11,000	2,200	13,200	
Non-Construction Cost		23,600	4,700	28,300	
Contract 06 - Monitoring		180,600	36,100	216,700	
07 Contract 07 - 589,600 CY					
07- A Construction Cost					
07- A/06 Fish and Wildlife Facilities					

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
07- A/06.03	Wildlife Facilities & Sanctuary					
07- A/06.03.73	Habitat and Feeding Facilities					
07- A/06.03.73/01	Monitoring		128,000	25,600	153,600	
	Habitat and Feeding Facilities		128,000	25,600	153,600	
	Wildlife Facilities & Sanctuary		128,000	25,600	153,600	
	Fish and Wildlife Facilities		128,000	25,600	153,600	
07- A/17	Beach Replenishment					
07- A/17.00	Beach Replenishment					
07- A/17.00.01	Mob, Demob & Preparatory Work					
07- A/17.00.01/01	Mob, Demob & Preparatory Work		700,000	140,000	840,000	
	Mob, Demob & Preparatory Work		700,000	140,000	840,000	
07- A/17.00.16	Pipeline Dredging					
07- A/17.00.16/01	Pipeline Dredging	589600.00 CY	2,211,000	442,200	2,653,200	4.50
	Pipeline Dredging		2,211,000	442,200	2,653,200	
	Beach Replenishment		2,911,000	582,200	3,493,200	
	Beach Replenishment		2,911,000	582,200	3,493,200	
	Construction Cost		3,039,000	607,800	3,646,800	
07- B	Non-Construction Cost					
07- B/30	Planning, Engineering and Design					
	Planning, Engineering and Design		243,000	48,600	291,600	
07- B/31	Construction Management (S&I)					
	Construction Management (S&I)		213,000	42,600	255,600	
	Non-Construction Cost		456,000	91,200	547,200	

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PROJECT BMA306: Martin County, Florida - Shore Protection Project

Martin County Shore Protection Project SUMMARY PAGE 10

** PROJECT OWNER SUMMARY - LEVEL 6 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
Contract 07 - 589,600 CY		3,495,000	699,000	4,194,000	
08 Contract 08 - 589,600 CY.					
08- A Construction Cost					
08- A/06 Fish and Wildlife Facilities					
08- A/06.03 Wildlife Facilities & Sanctuary					
08- A/06.03.73 Habitat and Feeding Facilities					
08- A/06.03.73/01 Monitoring		128,000	25,600	153,600	
Habitat and Feeding Facilities		128,000	25,600	153,600	
Wildlife Facilities & Sanctuary		128,000	25,600	153,600	
Fish and Wildlife Facilities		128,000	25,600	153,600	
08- A/17 Beach Replenishment					
08- A/17.00 Beach Replenishment					
08- A/17.00.01 Mob, Demob & Preparatory Work					
08- A/17.00.01/01 Mob, Demob & Preparatory Work		700,000	140,000	840,000	
Mob, Demob & Preparatory Work		700,000	140,000	840,000	
08- A/17.00.16 Pipeline Dredging					
08- A/17.00.16/01 Pipeline Dredging	589600.00 CY	2,211,000	442,200	2,653,200	4.50
Pipeline Dredging		2,211,000	442,200	2,653,200	
Beach Replenishment		2,911,000	582,200	3,493,200	
Beach Replenishment		2,911,000	582,200	3,493,200	
Construction Cost		3,039,000	607,800	3,646,800	
08- B Non-Construction Cost					
08- B/30 Planning, Engineering and Design					

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
	Planning, Engineering and Design		243,000	48,600	291,600	
08- B/31	Construction Management (S&I)					
	Construction Management (S&I)		213,000	42,600	255,600	
	Non-Construction Cost		456,000	91,200	547,200	
	Contract 08 - 589,600 CY		3,495,000	699,000	4,194,000	
09	Contract 09 - 589,600 CY					
09- A	Construction Cost					
09- A/06	Fish and Wildlife Facilities					
09- A/06.03	Wildlife Facilities & Sanctuary					
09- A/06.03.73	Habitat and Feeding Facilities					
09- A/06.03.73/01	Monitoring		128,000	25,600	153,600	
	Habitat and Feeding Facilities		128,000	25,600	153,600	
	Wildlife Facilities & Sanctuary		128,000	25,600	153,600	
	Fish and Wildlife Facilities		128,000	25,600	153,600	
09- A/17	Beach Replenishment					
09- A/17.00	Beach Replenishment					
09- A/17.00.01	Mob, Demob & Preparatory Work					
09- A/17.00.01/01	Mob, Demob & Preparatory Work		700,000	140,000	840,000	
	Mob, Demob & Preparatory Work		700,000	140,000	840,000	
09- A/17.00.16	Pipeline Dredging					
09- A/17.00.16/01	Pipeline Dredging	589600.00 CY	2,211,000	442,200	2,653,200	4.50
	Pipeline Dredging		2,211,000	442,200	2,653,200	
	Beach Replenishment		2,911,000	582,200	3,493,200	

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PROJECT BNA306: Martin County, Florida - Shore Protection Project

Martin County Shore Protection Project SUMMARY PAGE 12

** PROJECT OWNER SUMMARY - LEVEL 6 (Rounded to 100's) **

	QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
Beach Replenishment		2,911,000	582,200	3,493,200	
Construction Cost		3,039,000	607,800	3,646,800	
09- B Non-Construction Cost					
09- B/30 Planning, Engineering and Design					
Planning, Engineering and Design		243,000	48,600	291,600	
09- B/31 Construction Management (S&I)					
Construction Management (S&I)		213,000	42,600	255,600	
Non-Construction Cost		456,000	91,200	547,200	
Contract 09 - 589,600 CY		3,495,000	699,000	4,194,000	
10 Contract 10 - 589,600 CY					
10- A Construction Cost					
10- A/06 Fish and Wildlife Facilities					
10- A/06.03 Wildlife Facilities & Sanctuary					
10- A/06.03.73 Habitat and Feeding Facilities					
10- A/06.03.73/01 Monitoring		128,000	25,600	153,600	
Habitat and Feeding Facilities		128,000	25,600	153,600	
Wildlife Facilities & Sanctuary		128,000	25,600	153,600	
Fish and Wildlife Facilities		128,000	25,600	153,600	
10- A/17 Beach Replenishment					
10- A/17.00 Beach Replenishment					
10- A/17.00.01 Mob, Demob & Preparatory Work					
10- A/17.00.01/01 Mob, Demob & Preparatory Work		700,000	140,000	840,000	
Mob, Demob & Preparatory Work		700,000	140,000	840,000	

Thu 09 Jun 1994 U.S. Army Corps of Engineers TIME 15:52:14

PROJECT BMA306: Martin County, Florida - Shore Protection Project

Martin County Shore Protection Project SUMMARY PAGE 13

** PROJECT OWNER SUMMARY - LEVEL 6 (Rounded to 100's) **

		QUANTITY UOM	CONTRACT	CONTING	TOTAL COST	UNIT COST
10- A/17.00.16	Pipeline Dredging					
10- A/17.00.16/01	Pipeline Dredging	589600.00 CY	2,211,000	442,200	2,653,200	4.50
	Pipeline Dredging		2,211,000	442,200	2,653,200	
	Beach Replenishment		2,911,000	582,200	3,493,200	
	Beach Replenishment		2,911,000	582,200	3,493,200	
	Construction Cost		3,039,000	607,800	3,646,800	
10- B	Non-Construction Cost					
10- B/30	Planning, Engineering and Design					
	Planning, Engineering and Design		243,000	48,600	291,600	
10- B/31	Construction Management (S&I)					
	Construction Management (S&I)		213,000	42,600	255,600	
	Non-Construction Cost		456,000	91,200	547,200	
	Contract 10 - 589,600 CY		3,495,000	699,000	4,194,000	
	Martin County, Florida		23,069,600	4,525,400	27,595,100	

FOR OFFICIAL USE ONLY

APPENDIX C

REAL ESTATE PLAN

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REAL ESTATE PLAN
MARTIN COUNTY SHORELINE PROTECTION PROJECT, FLORIDA
GENERAL DESIGN MEMORANDUM

1. NATURE OF REPORT.

This Real Estate Section is for the General Design Memorandum (GDM) portion of a proposed shoreline protection project located in Martin County, Florida and is a general discussion of real estate requirements for the proposed project, recommendations as to estates to be acquired, a gross appraisal of the necessary land and interests therein and other features considered desirable, in order to present all major real estate problems and to recommend solutions. This report is for planning purposes only and both the final real property acquisition lines and the estimate of value are subject to change, following approval of the GDM.

2. AUTHORIZATION

Resolution adopted 18 May 1973 by the Committee on Public Works of the United States Senate which reads as follows:

Resolved, by the committee on public works of the United States Senate, that, in accordance with Section 110 of the River and Harbor Act of 1962, the Secretary of the Army is hereby requested to direct the Chief of Engineers, to make a survey of the Shores of Martin County, Florida, and such adjacent shores as may be necessary in the interest of beach erosion control, hurricane protection, and related purposes.

Further, construction of the Shoreline Protection project at Martin County described in House Document 2740A, the Water Resources Development Act (WRDA) of 1990, was authorized by the Chief of Engineers on November 20, 1989, in accordance with Section 101 of the Water Resources Development Act of 1990.

3. PROJECT LOCATION AND DESCRIPTION.

a. Project Location. The project for initial beach fill and periodic nourishment is located on a barrier island known as Hutchinson Island which is approximately 20 miles long, running North and South. Martin County is located on Florida's south central coast, 40 miles north of West Palm Beach, Florida and 100 miles north of Miami, Florida. The width of the island varies from over 100 yards to about one half mile. Hutchinson Island is located approximately six miles across from two causeway bridges

from the downtown areas of Stuart and Jensen Beach. The recommended plan for the beach fill and periodic nourishment runs along the northern 3.75 miles of shorefront in Martin County. The proposed project area runs from North to South, beginning at the county lines of Martin and St. Lucie at R-1, to approximately R-23 southward. The project includes an offshore borrow area for suitable quantities of sand material to use for beach fill. The borrow area is located 3000 feet offshore of southern Hutchinson Island and about 3 miles northeast of St. Lucie Inlet.

b. Project Description. The recommended plan provides for a protective and recreational beach along 3.75 miles of the northernmost shorefront of Hutchinson Island in Martin County. The plan of improvement for initial beach fill and periodic nourishment would restore the primary dune (between monuments R-1 and R-23) to a 20 foot wide crest at +13.6 mean low water (MLW) with a 1 vertical on 5 horizontal slope to the elevation of the berm; and provide a 35 foot wide berm (between monuments R-2 to R-21) at +9.1 feet MLW, with a 1 vertical on 8.5 horizontal foreshore slope to mean low water then a 1 vertical on 20 horizontal slope to the existing bottom. In order to maintain the protective beach, advance nourishment is included in the initial beach fill, and periodic nourishment would be provided at 11 year intervals to replace anticipated erosion losses.

A perpetual easement for Beach Renourishment, contained in paragraph 21.a., provides rights required along this beach front on the private land landward from the ECL to the landward construction line for initial beach fill, periodic renourishment, and dune renourishment, as well as making the area open to the public. This estate along with current County zoning regulations allows the local sponsor to prohibit public access to the dunes themselves. The costs of construction are cost shareable and administrative costs for lands are creditable in front of developed private lots where perpetual easements make the lands open to the public. However, in front of undeveloped private lands, the cost of construction and lands are 100% non-Federal as there is no Federal interest.

A temporary easement for Beach Nourishment and Work Area, contained in paragraph 21.b., is needed for lands landward of the Corps Construction Line or perpetual easements where sand placement may be necessary to avoid creating a gap between the toe of the dune and retaining walls or structures. All of these areas will be identified prior to land certification. All costs associated with these lands are 100% non-Federal responsibility.

Access to the project will be by sea, public streets and public recreation parks. A temporary easement for access, contained in paragraph 21.c., is provided if needed.

The Local Sponsor will obtain a Consent of Use from the State of Florida for the rights needed seaward of the Erosion Control Line (ECL) for initial beach fill and periodic renourishment along the 3.75 mile long beach area. The Consent of Use will also include the rights needed for the borrow site and any pipeline access. Refer to paragraph 21.d. for a description of Consent of Use.

4. **INVOLVEMENT OF STATE AND FEDERAL AGENCIES.**

Martin County Board of Commissioners, 2401 S.E. Monterey Road, Stuart, Florida 34996, is the local sponsor. It is recommended that the local sponsor be responsible for operation and maintenance of the project after construction. Any relocation or cost associated therewith of private property or private utilities will be the responsibility of the local sponsor.

The Corps of Engineers will act as the lead agency for implementation of the project.

The project will be implemented in coordination with Martin County Board of Commissioners, the local sponsor, throughout the design and construction phases of the project.

Prior to actual construction, the sponsor must provide certification that all necessary lands for the upcoming contract are available and suitable ownerships or easements have been obtained. Also, suitable records must be maintained by the sponsor on all costs associated with the project to assure proper credit.

5. **ATTITUDE OF LANDOWNERS.**

Landowners affected by the proposed project are very supportive of the shore protection project due to the severe erosion along the shoreline. The local news media has also been very supportive of the project.

6. **GOVERNMENT-OWNED LAND.**

There exists no Federal Government land within the proposed project area.

7. **SPONSOR-OWNED LAND.**

Approximately 10 acres of the proposed project land area is owned by Martin County. These existing areas consist of approximately nine recreation parks, beaches and public parking facilities open to the public. Refer to Table B-12, Page B-23, for names and locations of public beaches and accesses.

8. **LOCAL SPONSORS LAND ACQUISITION AND FINANCIAL CAPABILITY.**

The Martin County Board of Commissioners is empowered by Chapter 161.25 of the Florida Statues to act as the County beach and shore preservation authority. Such powers include the authority to make contracts and enter into agreements, to acquire and hold lands and property by any lawful means, to exercise the power of eminent domain, and to construct, acquire, operate and maintain shore protection works and facilities. The County has the authority to tax property or issue bonds to meet the costs of the County beach and shore preservation program.

Martin County has experience in land acquisition however, they do not have the manpower to meet the acquisition schedule. The County has contracted a consulting firm to acquire all lands needed to support the project. The consulting firm has extensive experience in land acquisition for projects supported by state and federal funds. The firm is also very knowledgeable of the Federal rules and regulations for acquiring lands.

9. **APPRAISAL INFORMATION.**

a. Appraisal Report. The Gross Appraisal inspection was performed on November 18, 1993. The proposed project area contains 80 ownerships. The appraiser indicates that in no case are ownerships diminished in value after imposition of the proposed easements described in the following paragraph 21 of this report. Further, no land is physically lost or cut away by the project; no views would be blocked and existing coastal construction setback line would remain in place. No structures are taken and access is not restricted or reduced beyond its present restrictions. Section 33-72 of Martin County zoning ordinance, also known as the "Martin County Barrier Island Ordinance" states "it shall be a violation of this ordinance for any person to cross a dune within 500 feet of an elevated dune crossing, except by way of that elevated dune crossing." The county has constructed public walkovers at approximately every 1,000 feet throughout the project shoreline. (Refer to Real Estate Plates.)

b. Methodology Used in Appraisal. Both Federal and State of Florida rules of appraisal were used. Under the Federal rule, special benefits are offset against the entire just compensation award. Under the State of Florida rule, special benefits are offset against severance damages only. Under both rules the "before" and "after" method of appraisal is used.

c. Character. Martin County is one of the State's fastest growing areas. The six towns included in Martin County are Stuart, Palm City, Jensen Beach, Port Salerno, Indiantown and Hobe Sound. The economy is driven by retail, service, tourism, construction, government and agriculture. Martin County is located in an area known as the Treasure Coast. It contains 556 square miles with a population of approximately 103,000.

d. Present Use. Land uses in the proposed project area are single and multi-family residents, commercial (a realty office, the Hutchinson Island Inn) with State and County owned recreational areas intermixed.

e. Economic Conditions. There are no known economic conditions that might affect the value or use of the lands within the proposed project area in the foreseeable future.

f. Gross Estimate of Value. There is no diminution in value to the affected ownerships caused by the easement's restriction upon the owners ingress and egress by way of the dune. Imposition of the easements does not adversely affect value for reasons described in foregoing paragraph 7a. It is reasonable to conclude that the "after" value of the ownerships would be at least that of the "before" value, equaling zero just compensation under Federal rules. Due to the severe erosion of these lands, the value appears to be nominal. Therefore, the appraiser concludes zero value for the easements needed to support this project.

The local sponsor may incur costs when acquiring lands needed to support the project; however, crediting for this project will be based on Federal rules of valuation. The local sponsor is entitled to credit for the administrative costs associated with acquiring these lands but not for the purchase price of these lands.

10. RELOCATION ASSISTANCE (P.L.91-646).

There will be no need to relocate any persons or businesses with this project's implementation.

11. **RELOCATIONS.**

There are no known utilities, roads, highways or railroads that will require relocation.

12. **ACQUISITION/ADMINISTRATIVE COST ESTIMATES.**

a. Federal:

Project Planning	$ 10,000
Review of Acquisitions (80 @ $250 ea)	20,000
Review of Appraisals (80 @ $300 ea)	24,000
Review of Condemnations (10 @ $2,000)	20,000
Real Estate Review of PCA	2,000
Total Federal Acquisition/Administrative Cost:	$ 76,000

b. Non-Federal

Acquisitions (80 @ $1,000 ea)	$ 80,000
Appraisals (80 @ $600 ea)	48,000
Condemnations (est 10 @ $10,000 ea)	100,000
Temporary/Licenses/Rights-of-Entry	5,000
Damage Claims	5,000
Total Non-Federal Acquisition/Administrative Cost	$238,000

13. **RECREATION.**

There are no recreational benefits in the proposed project except aesthetical enhancement of the beaches.

14. **STRUCTURES AND FACILITIES.**

There are no known structures or facilities that come within the purview of Section III of the Act of Congress approved July 3, 1958 (P.L. 85-500).

15. **DISPOSAL OF FACILITIES.**

Wood frame crossovers in the project area where the dunes will be enlarged may need to be removed. Replacement of private walkovers is the responsibility of the property owner. The local sponsor is responsible for replacing public walkovers since access to the beach is a prerequisite of this project.

16. **MINERAL RIGHTS.**

There exist no known minerals of value in the proposed project area.

17. **STANDING TIMBER AND VEGETATIVE COVER.**

Aerial maps indicate the presence of vegetative cover along the beach area of the proposed project. Discussions in meeting held on November 8, 1993 between Corps personnel and sponsor, indicated that the State of Florida prohibits removal of any grasses or vegetation on the dunes or beaches and no beach nourishment may be placed which would cover over any such vegetation.

18. **MAPS.**

Real Estate Project maps are shown on the plates located at at the end of this appendix. The maps identify publically owned lands, the Erosion Control Line and the Corps Construction Line.

19. **ESTIMATED COSTS OF LANDS, EASEMENTS, RIGHTS-OF-WAY AND RELOCATIONS (LERR) FOR THE PROJECT.** (See attached Exhibit A for itemized Chart of Accounts)

1.	Lands and Damages (Perpetual Easements - Approximately 24 acres)	0
	Improvements	0
	Severance	0
	Minerals	0
2.	Acquisition - Administrative Costs (Includes Corps Real Estate planning and monitoring costs)	
	Federal	$ 76,000
	Non-Federal	$238,000
3.	PL 91-646	0
4.	Contingencies (25%) (Rounded to next thousand)	$ 79,000
	TOTAL	$393,000

20. **HAZARDOUS TOXIC AND RADIOACTIVE WASTES (HTRW).**

In accordance with ER-1165-2-132, an initial HTRW assessment appropriate for this study has been completed. No hazardous or toxic wastes have been identified in the proposed project area.

21. **ESTATES TO BE ACQUIRED.**

a. Perpetual Easement for Beach Renourishment A perpetual and assignable easement and right-of-way in, on over and across the hereinafter described land for use by Martin County, its representatives, agents, contractors, and assigns, to nourish, renourish, protect, operate and maintain a public beach thereon, including the right to provide use by the public; to deposit sand; to accomplish any alterations or contours on said land; to construct dunes and berms; to erect protective silt screens and fences; and to perform any other work necessary and incident to the construction and maintenance of the Martin County Shore Protection Project, together with the continuing right to clear and remove any brush, debris, vegetation, structures and obstructions which, in the opinion of the representatives of Martin County, may be detrimental to the project; and further excepting and reserving to the landowner the right to construct a wooden walkway access structure across said easement, provided that the manner of construction and location of the walkway is first approved in writing by the representatives of Martin County and reserving to the landowner all such rights and privileges as may be used and enjoyed without interfering with the use of the Project for the purposes authorized by Congress or abridging the rights and easements hereby acquired, provided that no excavation shall be conducted and no landfill placed on the land by the landowner and that no existing structures may be modified nor shall any additional structures be constructed on the land except as provided above. This easement is taken subject to existing easements for public roads and highways, public utilities, railroads and pipelines.

b. Temporary Beach Nourishment and Work Area Easement A temporary and assignable easement and right-of-way for the Beach Nourishment Project for Martin County, in, on, over and across (the land described in Schedule A) for a period not to exceed three years beginning _____, for use by the local sponsor, its representatives, agents, and contractors for beach nourishment/disposal and a work area including the right to move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Beach Nourishment Project for Martin County, together with the right to trim, cut fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the

landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

c. Temporary Access Road Easement. A temporary and assignable easement and right-of-way in, on, over, and across the land for a period not to exceed _____, for the location, construction, operation, maintenance, alteration, replacement and use of an access road and appurtenances thereto; together with the right to plant thereon trees, grass, shrubs and protect and control vegetation, to trim, cut, fell, remove, and dispose of any and all timber, trees, underbrush, obstructions, and other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the owners, their heirs and assigns, the right to use the surface of the land as access to their adjoining land; subject, however, to existing easements for public roads and highways, public utilities, railroads, and pipelines.

d. Consent of Use. The local sponsor acquires a Consent of Use from the State of Florida in lieu of an easement which allows placement of material seaward of the Erosion Control Line (ECL). The Consent of Use is issued when the Water Quality Certificate is approved by the Department of Environmental Protection and the ECL is approved by the Governor and Cabinet of the State of Florida.

The Consent to Use basically grants the rights to place sand on state owned submerged land in accordance with the beach nourishment plans submitted with the application for an erosion control line. Also included in this document is use of any submerged borrow areas and/or pipelines corridors. This document must be renewed with each renourishment contract.

22. **CHART OF ACCOUNTS**

01	LANDS AND DAMAGES		
01A00	PROJECT PLANNING		$10,000
01B--	ACQUISITIONS		
01B20	BY LOCAL SPONSOR (LS)		$80,000
01B40	REVIEW OF LS		20,000
01C--	CONDEMNATIONS		
01C20	BY LS		100,000
01C40	REVIEW OF LS		20,000
01E--	APPRAISALS		
01E30	BY LS		48,000
01E50	REVIEW OF LS		24,000
01G--	TEMPORARY PERMITS/LICENSES/RIGHTS-OF-ENTRY		
01G20	BY LS		5,000
01G60	DAMAGE CLAIMS		5,000
01M00	PROJECT RELATED ADMINISTRATION REAL ESTATE REVIEW OF PCA		2,000
01R--	REAL ESTATE PAYMENTS		
01R10	LAND PAYMENTS		
01R1B	BY LS		0
01R1D	REVIEW OF LS		0
01RX	CONTINGENCIES	78,500	
	TOTAL REAL ESTATE COSTS EXCLUDING CONTINGENCIES (RD)		$ 314,000
	TOTAL REAL ESTATE CONTINGENCIES COST (RD)	$ 79,000	
	TOTAL PROJECT REAL ESTATE COST (RD)		$ 393,000

Legend

Public Land

— — Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May 1994

PLATE C-1

Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

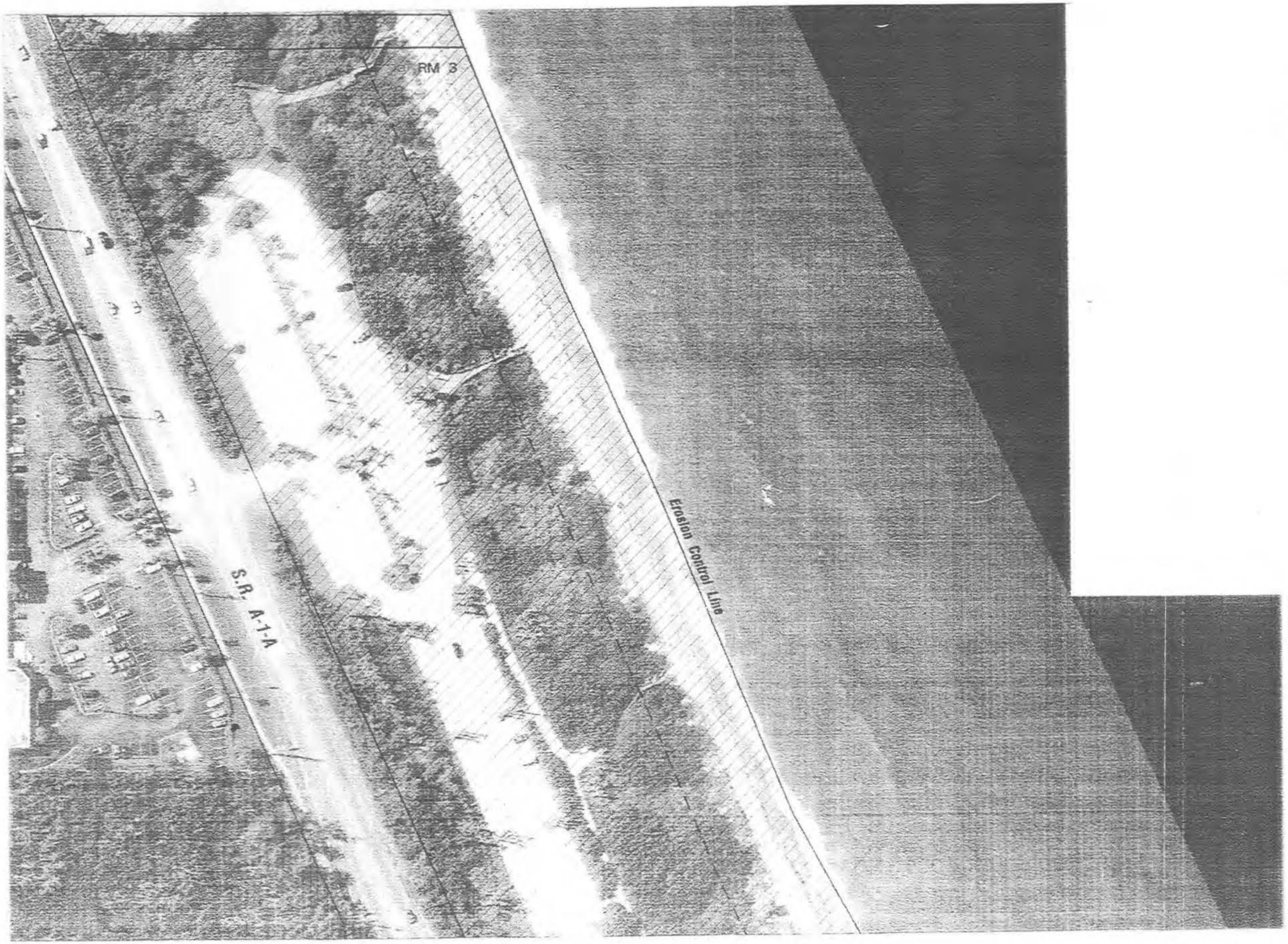
REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May, 1994

PLATE C-2



Legend

Public Land

Corps Construction Line

NORTH

SCALE 1" = 200'

100 0 100

SCALE IN FEET

NOTE: PERPETUAL EASEMENT IN LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

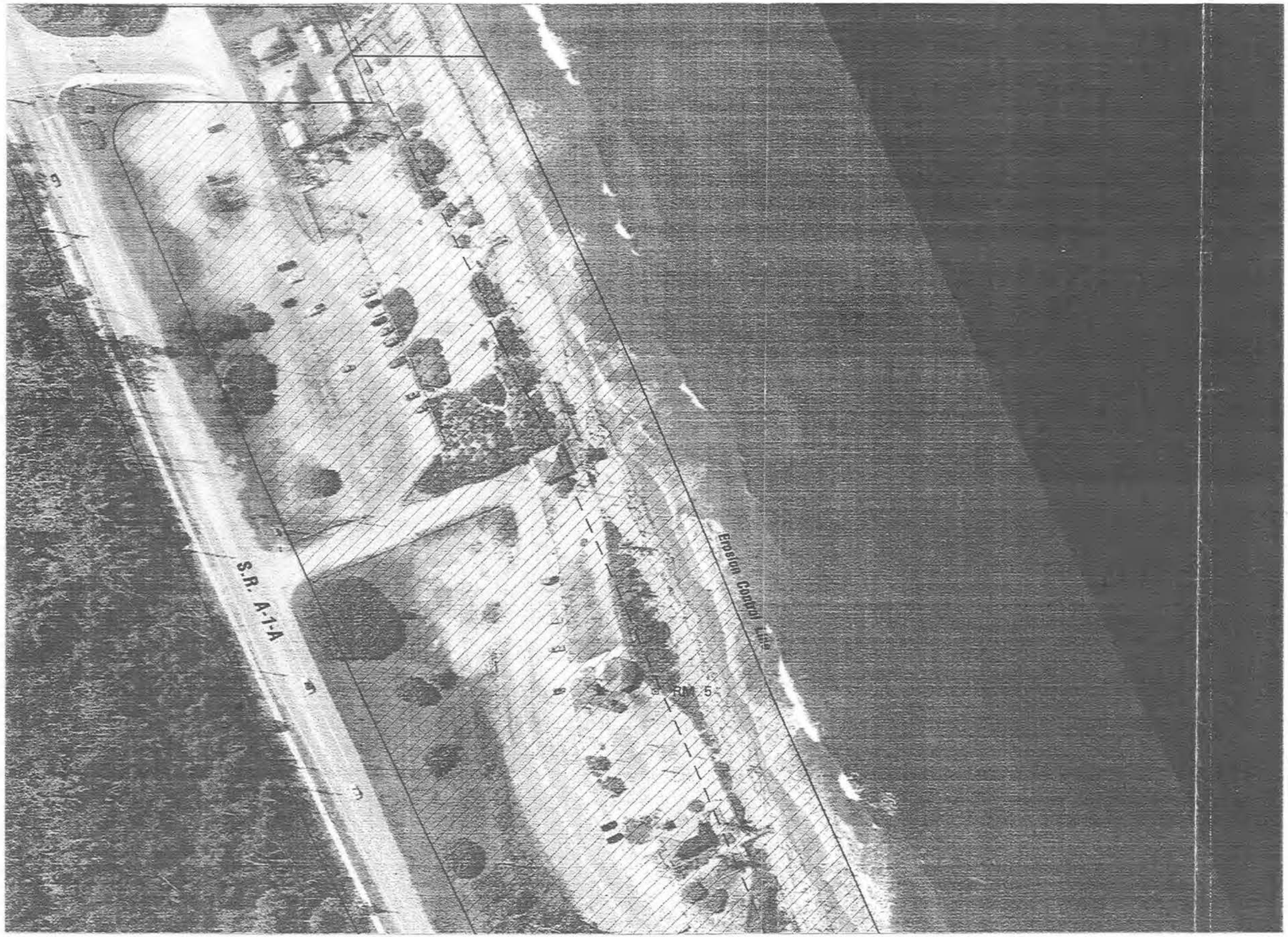
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
JENSEN BEACH, MARTIN COUNTY

PLATE C-3



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

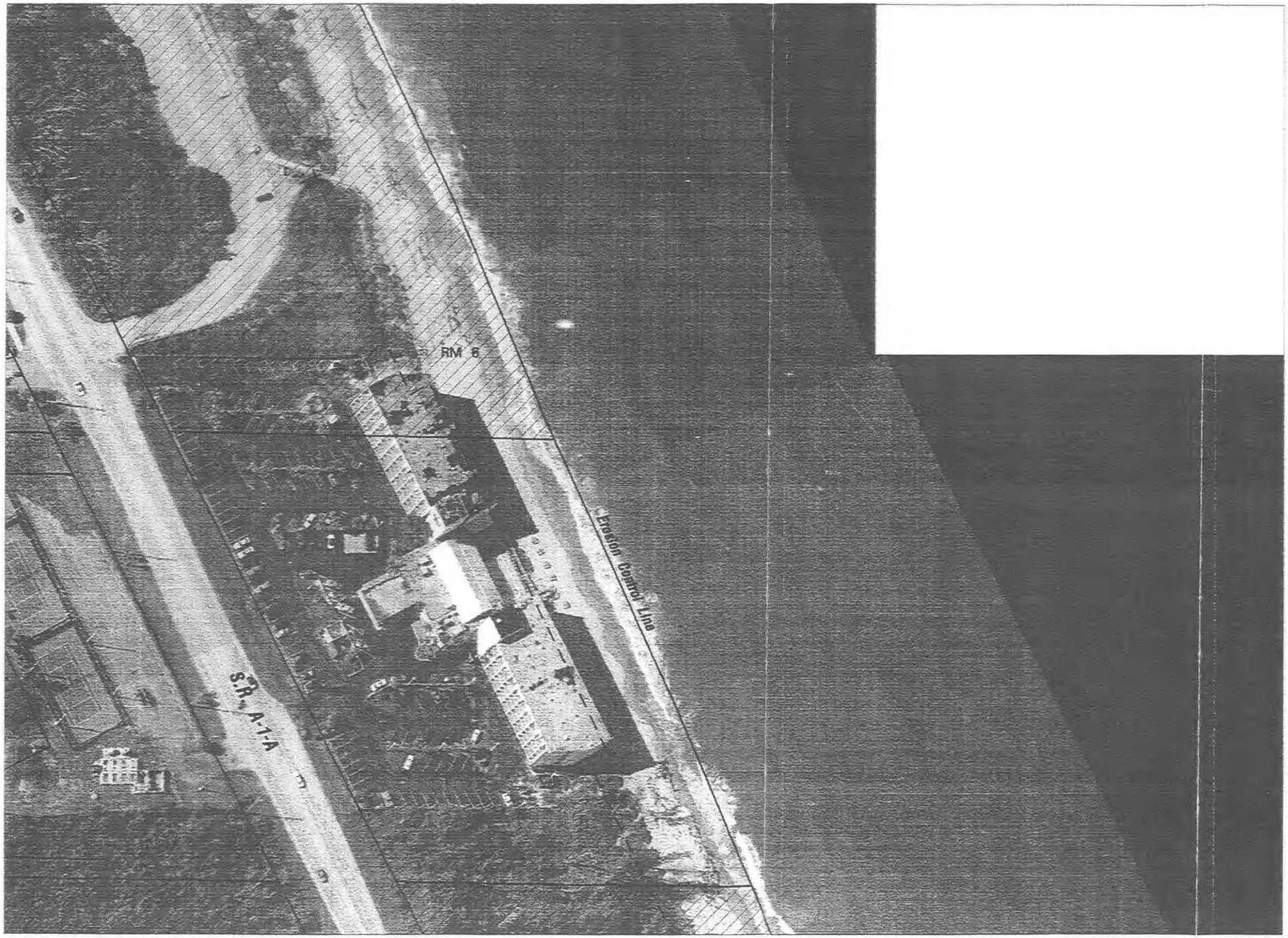
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May, 1994 PLATE C-4



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

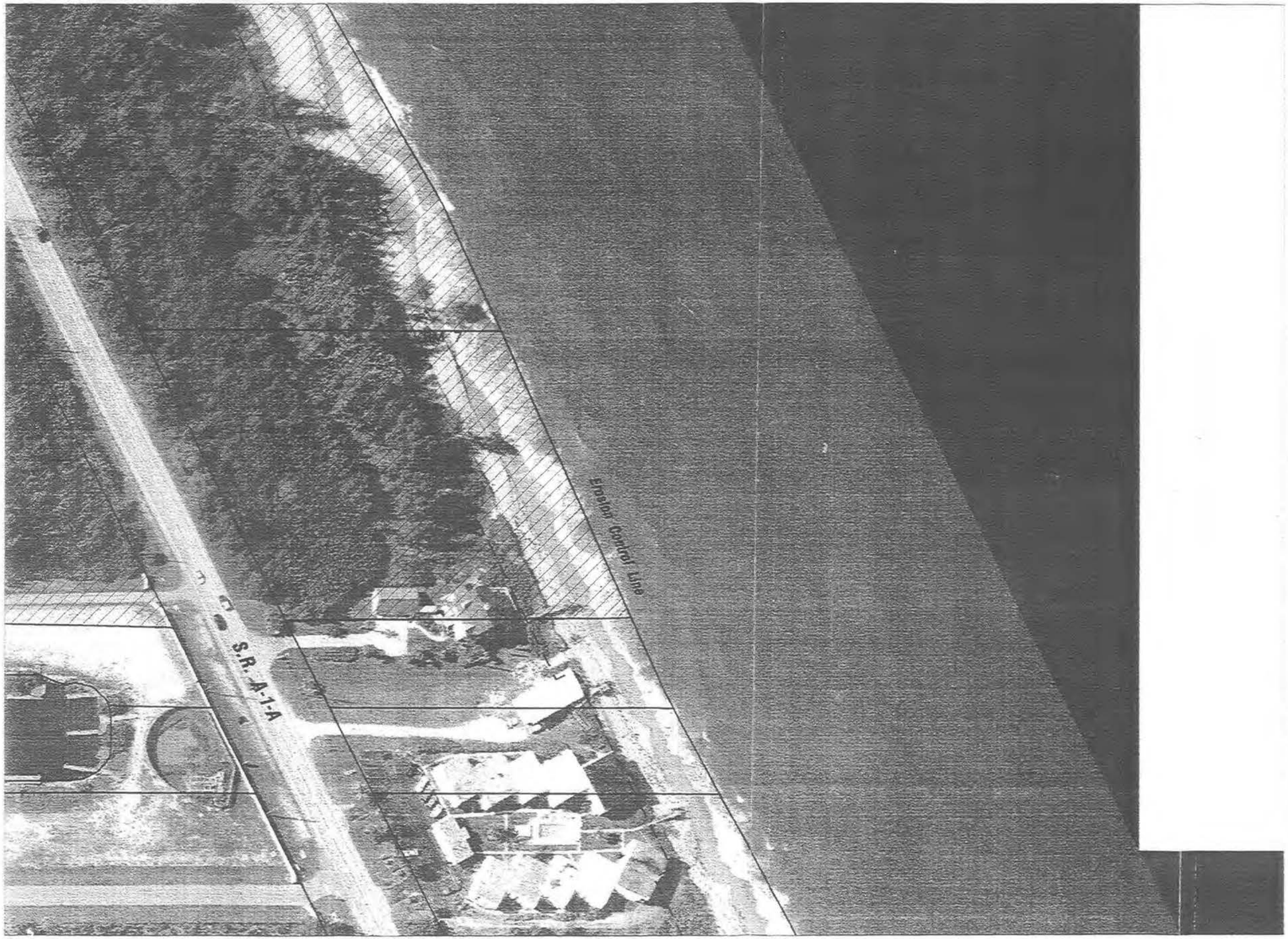
REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May, 1994

PLATE C-5



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

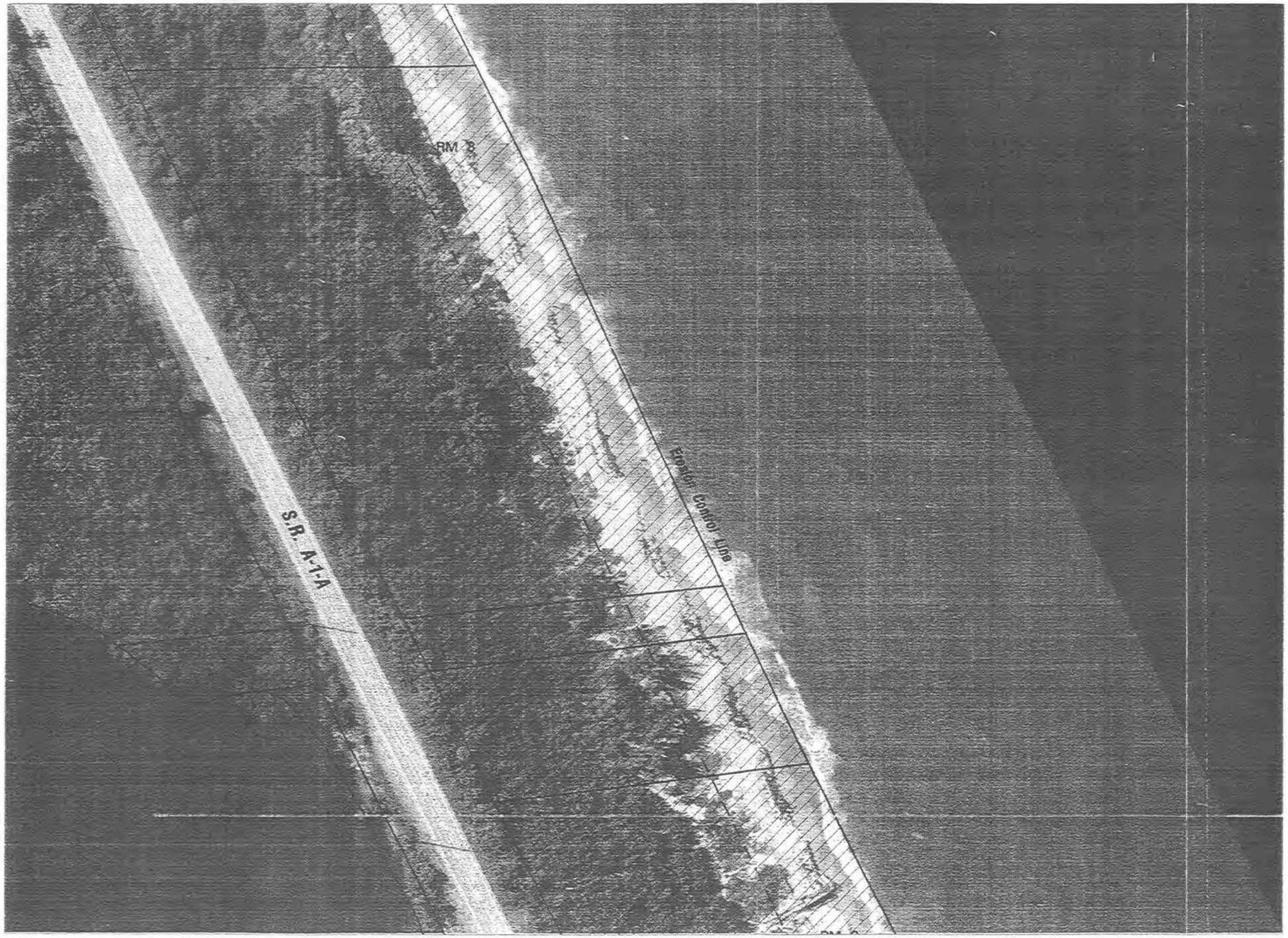
REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May 1994

PLATE C-6



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May, 1994

PLATE C-7

Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May 1994

PLATE C-8

Legend

Public Land

Corps Construction Line

NORTH

0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

PLATE

Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

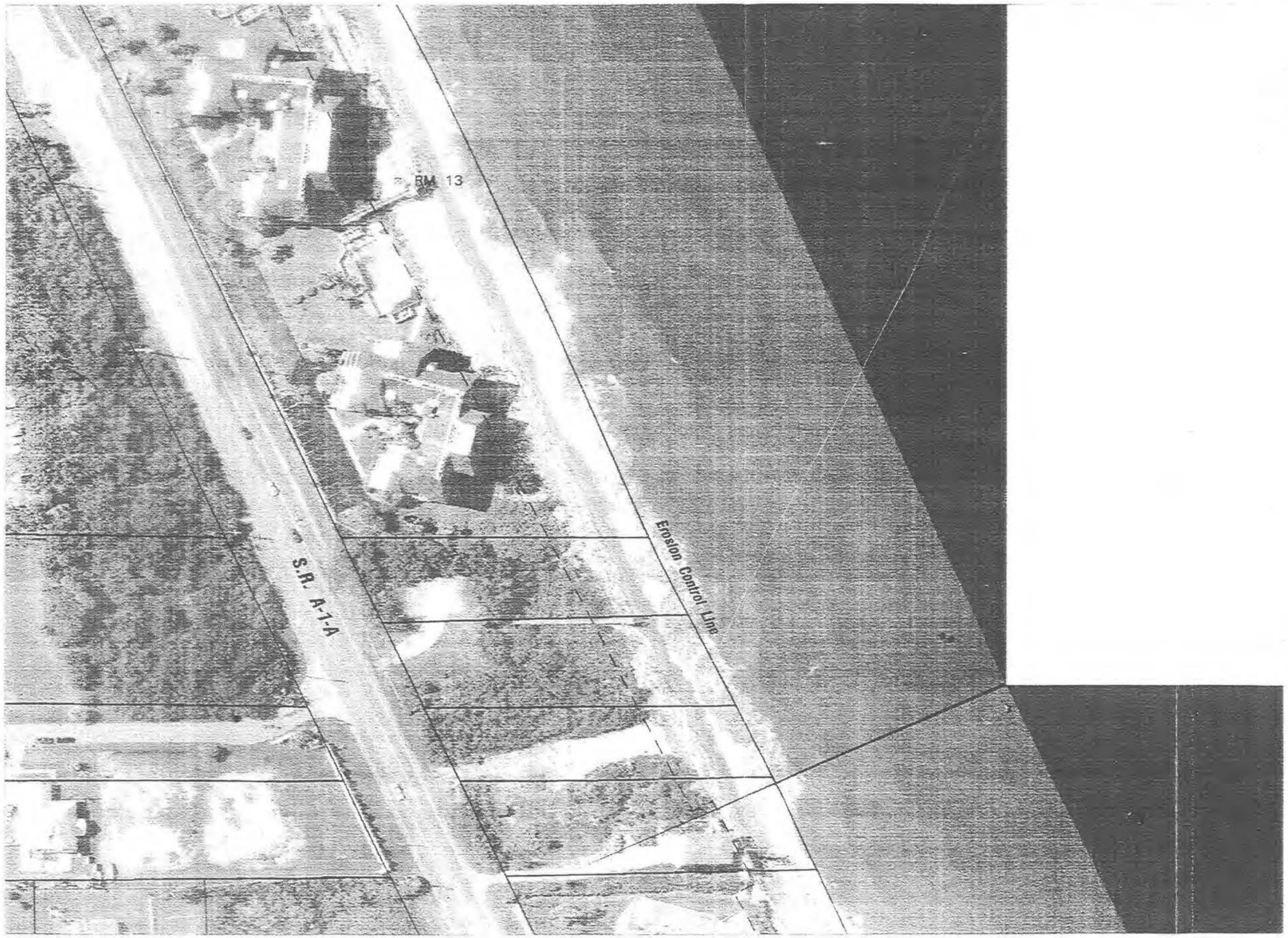
REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May, 1994

PLATE C-10



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

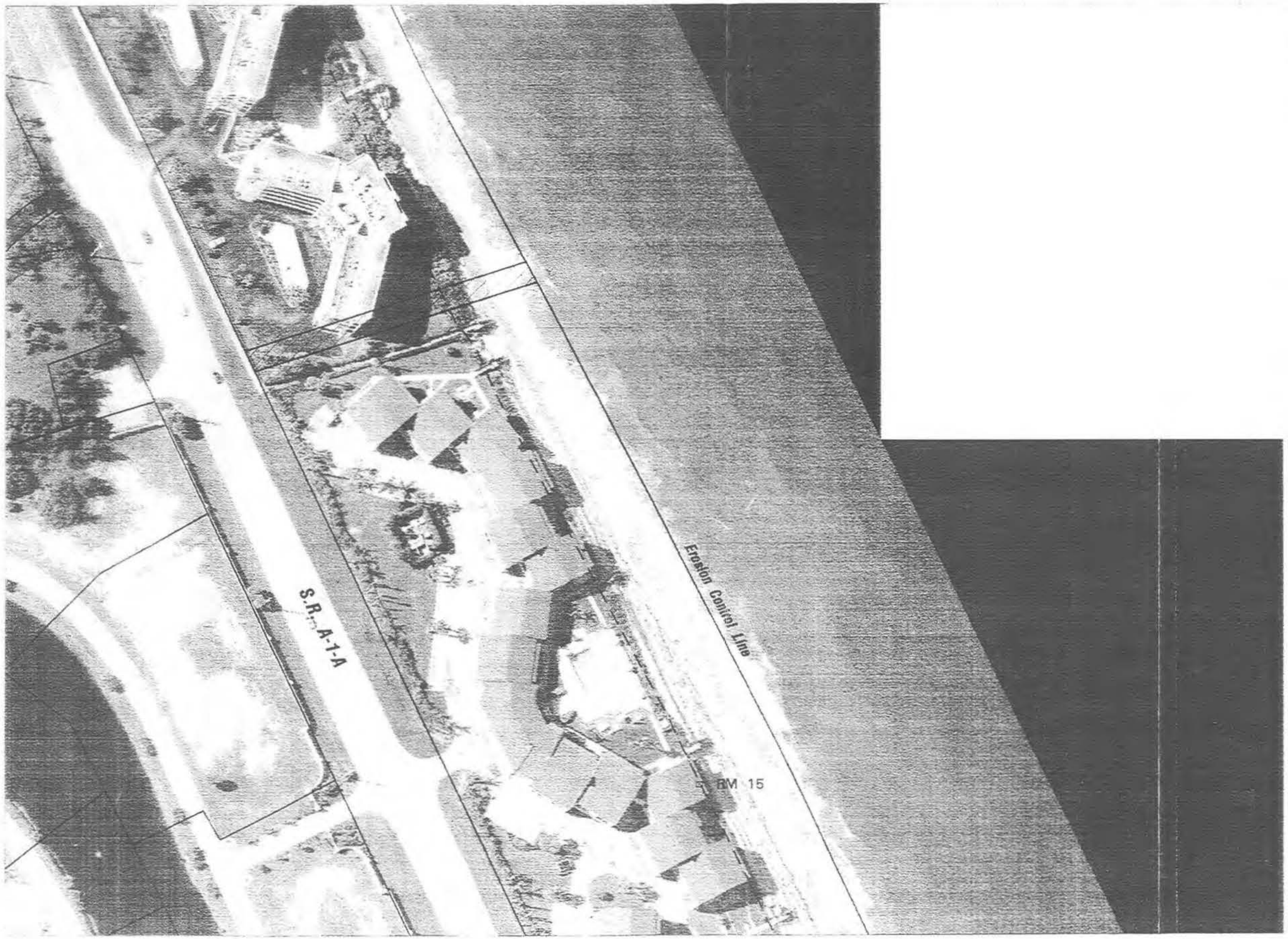
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

MAY 1994 PLATE C-11



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

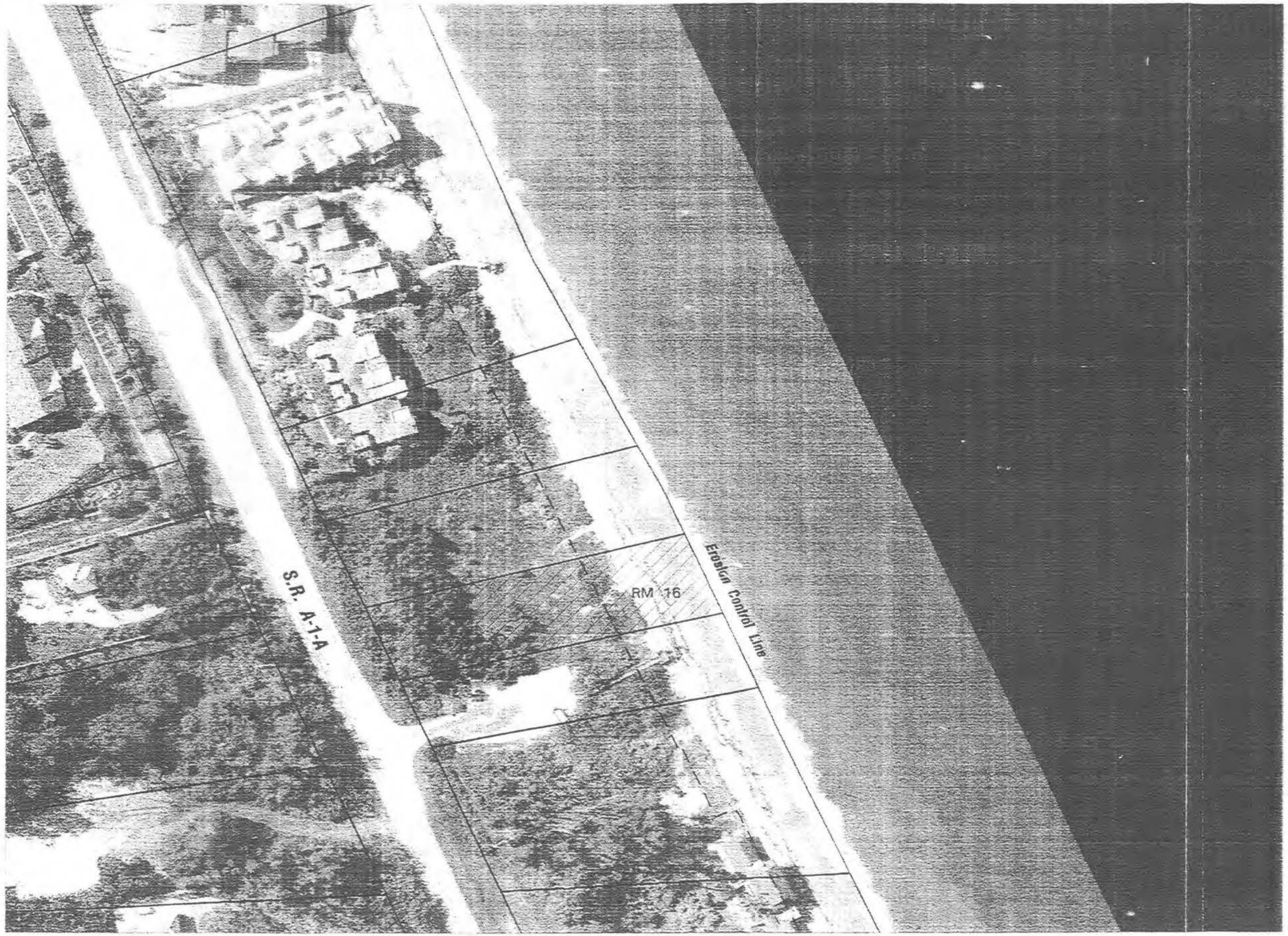
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

Mar 1994 PLATE C-12



Legend

Public Land

— — Corps Construction Line

NORTH

Scale 1" = 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

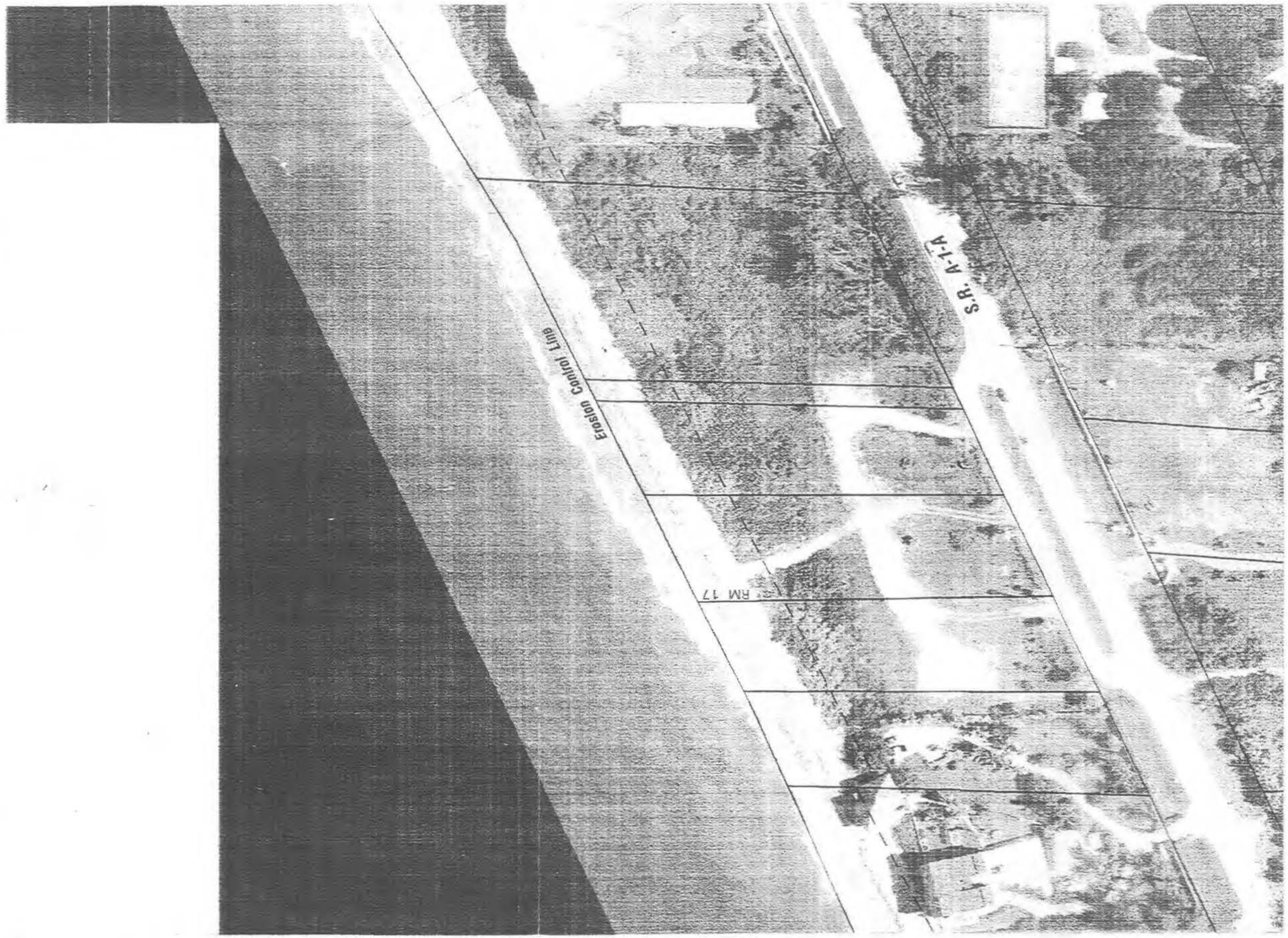
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

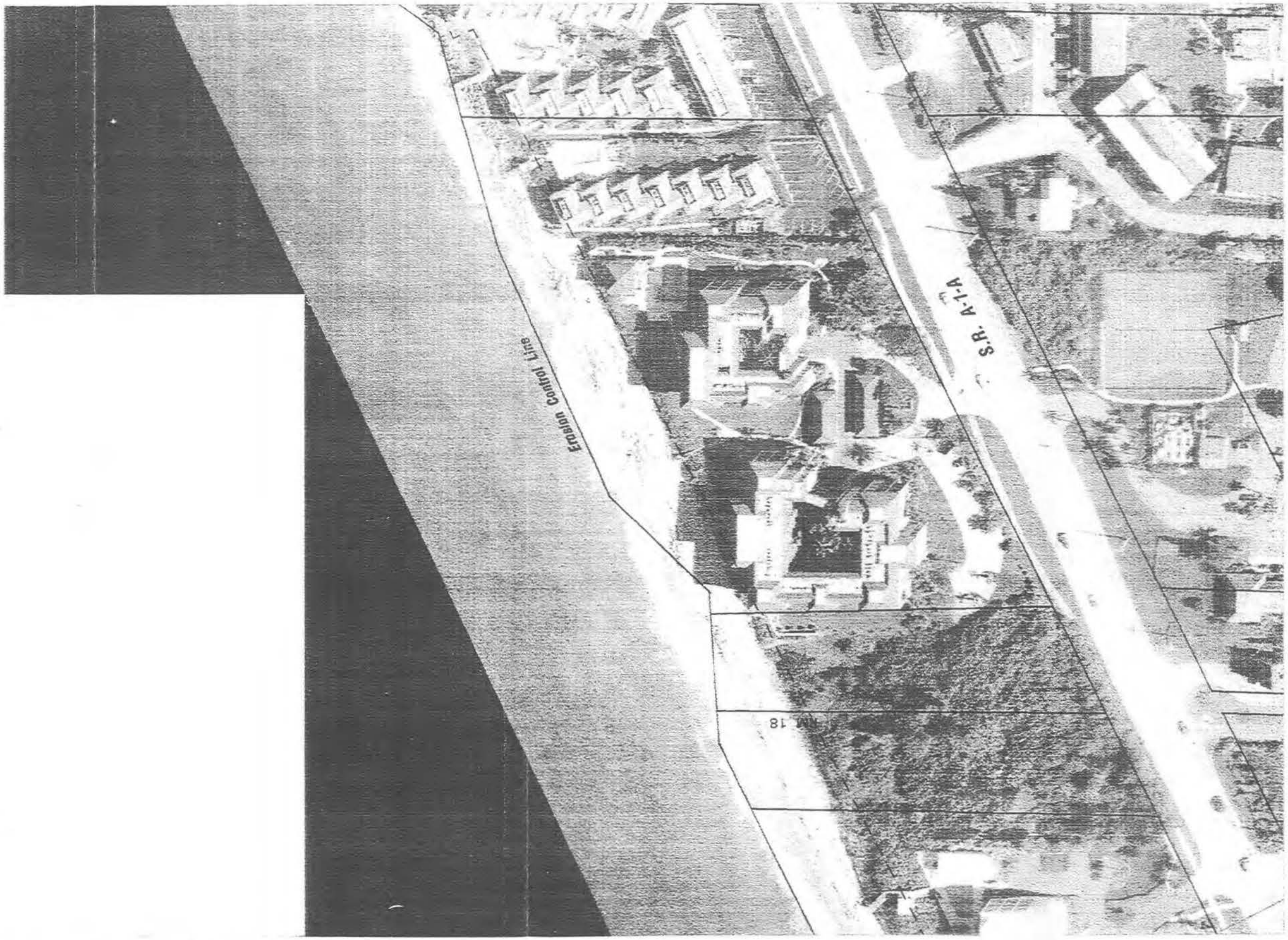
REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

Mar. 1994 PLATE C-13


S.R. A-1-A
Erosion Control Line
RM 17



Legend

Public Land

Erosion Control Line

NORTH

SCALE 1" = 1200'

0 100 200

SCALE 0 FEET

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE

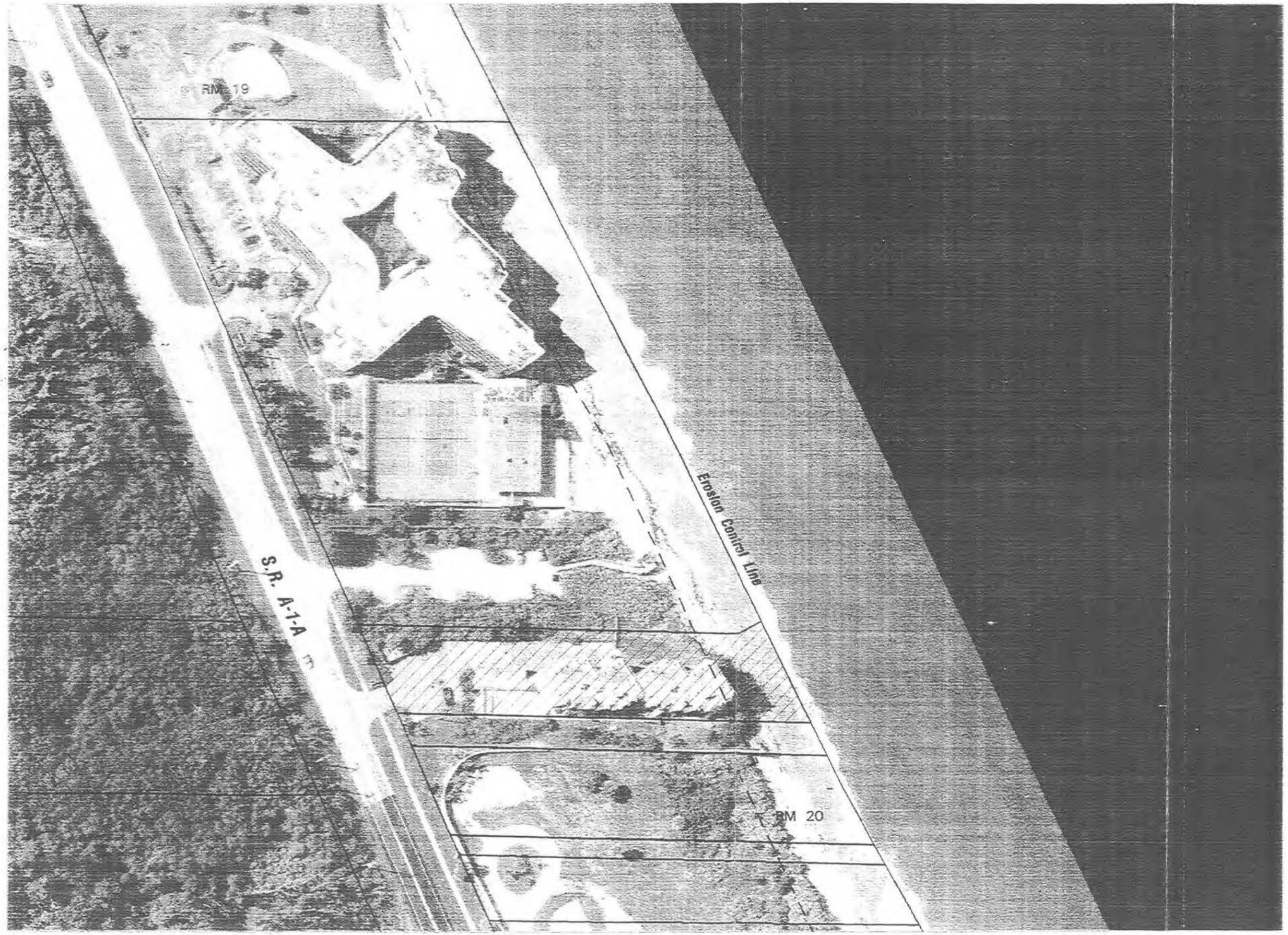
MARTIN COUNTY, FLORIDA
INLET PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

PLATE D-16



Legend

Public Land

Corps Construction Line

NORTH

Scale 1:1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

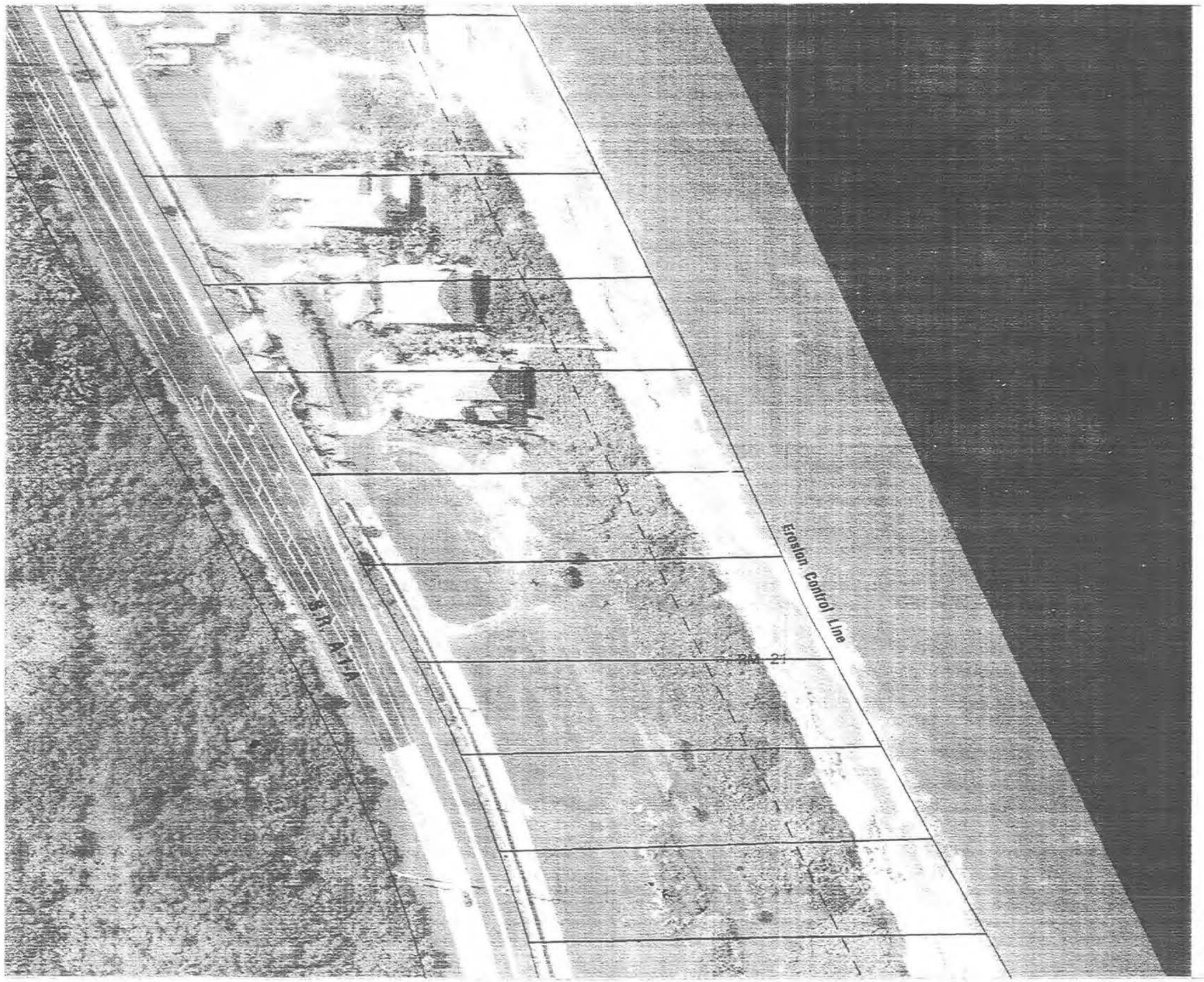
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

Mar 1994 PLATE C-19



Legend

Public Land

Corps Construction Line

NORTH

Scale 1:1200

100 1 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

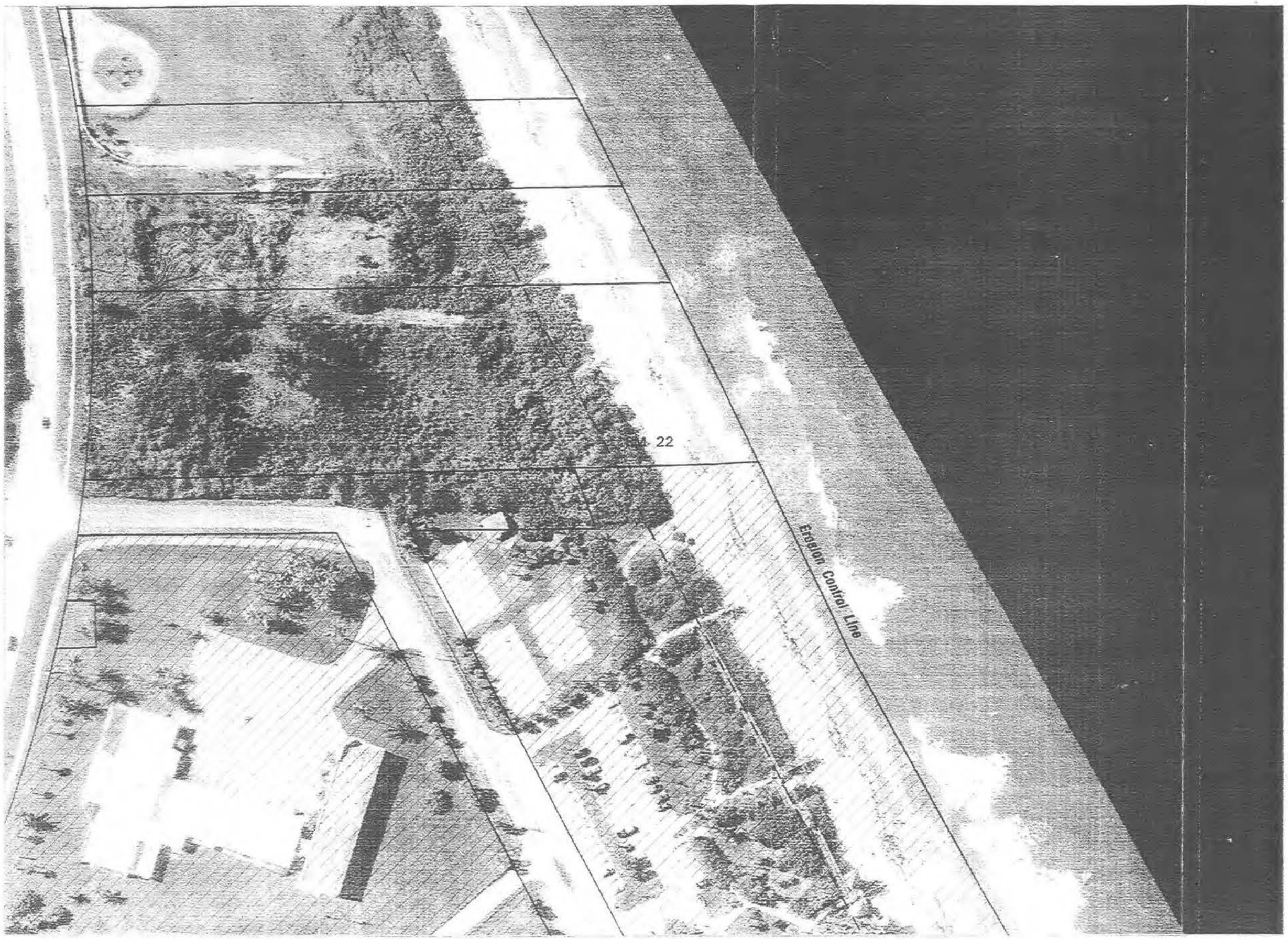
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

MAY 1994 PLATE C-17



Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

Mar 1994 PLATE C-18

Legend

Public Land

Corps Construction Line

NORTH

Scale 1 : 1200

100 0 100

Scale in Feet

NOTE: PERPETUAL EASEMENT ON LANDS BETWEEN THE CORPS CONSTRUCTION LINE AND EROSION CONTROL LINE.

MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT

REAL ESTATE PLANNING MAP

SCALE AS SHOWN

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
PREPARED BY MARTIN COUNTY

May, 1994

PLATE C-18

APPENDIX D

PERTINENT CORRESPONDENCE

429

422

MARSHAL L. WILCOX
District 1

JEFF KRAUSKOPF
District 2

JANET K. GETTIG
District 3

MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

PHONE (407) 288-5400

COUNTY OF MARTIN STATE OF FLORIDA

June 9, 1994

ENG-CI-94-353L

Richard E. Bonner, P.E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

4-Mile Beach Renourishment
Martin County Project # 93E-CP-004

Dear Mr. Bonner:

This is in reference to the Martin County, Florida beach erosion control project. This letter reiterates Martin County's desire to act as the non-Federal sponsor of the 3.75 mile beach nourishment project as described in the General Design Memorandum (GDM) dated December 1993 (revised June 1994).

We have reviewed the GDM and understand and intend to provide the items of project cooperation, including the provision of lands easements, rights-of-way, relocations, and the non-Federal share of project costs. We understand that the items of project cooperation will be specifically set forth in a Project Cooperation Agreement (PCA), to be executed at a future date by the U.S. Army Corps of Engineers and Martin County.

The Martin County Board of County Commissioners is empowered by Chapter 161, Florida Statutes, to act as the county beach and shore preservation authority. The County has the authority to tax property or issue bonds to meet the costs of the county beach and shore preservation program.

Chapter 161 FS also provides for State financial assistance in funding beach erosion control and shore preservation projects. We intend to continue to make application to the Division of Beaches and Shores, Florida Department of Environmental Protection, for State funds for this project. The State is authorized to fund up to 75 percent of the non-Federal construction and maintenance costs for this project, subject to certain restrictions.

We are completing the details of our financial plan and will provide them to you at the earliest possible date. Please let this office know if there is anything further that is needed to proceed with this project.

Sincerely,

Lee N. Schuman for
Donald E. Holloman, P.E.
County Engineer

DEH:LAW:bb
S:\cip\ci353l.law

cc: Peter Cheney, County Administrator

MARSHAL L. WILCOX
District 1

JEFF KRAUSKOPF
District 2

JANET K. GETTIG
District 3

MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

PHONE (407) 288-5400

COUNTY OF MARTIN STATE OF FLORIDA

December 8, 1993
COM-94-MW-007

VIA FAX

Colonel Terrance Salt
District Engineer, Jacksonville District
U. S. Army Corps of Engineers
P. O. Box 4970
Jacksonville, Florida 32232-0019

REF: Martin County, Florida 4-Mile Beach
Renourishment Project #93E-CP-004

Dear Colonel Salt:

About November 19th, Mr. William Pullen representing the Martin County Chapter of the Florida Shore and Beach Preservation Association called your office and was directed to speak with Mr. Rick McMillan, Project Manager. The purpose of this call was to arrange an update and briefing for the Association as to the current status of the project and how the group can in anyway help the project to fruition.

I sincerely support such a meeting. The Association has suggested the following dates: December 13th Monday, 15th Wednesday, or 16th Thursday. Once a time and date are established they will confirm the location of the meeting, which will most likely be at one of the Martin County area hotels.

Please confirm the date and time with Mr. William Pullen, General Manager of the Holiday Inn Oceanside, 3793 NE Ocean Boulevard, Stuart, Florida 34957 (TELEPHONE 407-225-3000/FAX 407-225-1956).

Sincerely,

Marshal L. Wilcox
County Commissioner

WM/c

cc: Mr. Pullen, Martin County Chapter
Florida Shore & Beach Preservation Assoc.

431

424

MARSHAL L. WILCOX
District 1

JEFF KRAUSKOPF
District 2

JANET K. GETTIG
District 3

MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

PHONE (407) 288 5400

COUNTY OF MARTIN STATE OF FLORIDA

November 23, 1993

ENG-CI-94-066L

Mr. Richard Bonner
Deputy District Engineer for Programs & Project Management
USACOE - Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: 4-Mile Beach Renourishment
Martin County Project #93E-CP-004

Dear Mr. Bonner:

On November 23, 1993 the Martin County Board of County Commissioners approved the United States Army Corps of Engineer's request to operate motorized all-terrain vehicles on selected beach/dune areas, through February, 1994 for beach surveys and placement of permanent survey monuments to continue design of this project. This approval does not release the USACOE from complying with any Florida Department of Environmental Protection permitting/work requirements.

Please have your on-site personnel coordinate these efforts with our beach supervisory Staff through Mr. Bill O'Brien, the County's Public Safety Director at 407-288-5693.

Please contact this office at 407-288-5927 with any further questions or comments.

Sincerely,

Donald E. Holloman, P.E.
County Engineer

DEH:LAW:djs

cc: Bill O'Brien, Public Safety Director

BOARD OF COUNTY COMMISSIONERS AGENDA ITEM SUMMARY FORM

1. WORDING FOR AGENDA: 9-A-2

4-MILE BEACH RENOURISHMENT
MARTIN COUNTY PROJECT #93E-CP-004
USACOE BEACH ACCESS REQUEST

2. MEETING DATE: November 23, 1993 **3. MEMO NO:** ENG-CI-94-065M
4. PREVIOUS AGENDA ITEM: N/A
5. AGENDA PLACEMENT: Departmental **6. REQUESTOR'S NAME:** D. Holloman

Estimated Time: 5 Minutes

7. EXECUTIVE SUMMARY:

The United States Army Corps of Engineers (USACOE) is requesting permission from the Martin County Board of County Commissioners (Board) to operate motorized vehicles on the beach areas, through February, 1994, for continuing design of the 4-Mile Beach Renourishment project.

8. BACKGROUND:

Fast-track design/permitting efforts with the USACOE and the Florida Department of Environmental Protection (FDEP) are continuing, to accelerate construction of this project to FY 94/95. The USACOE is requesting permission to operate all-terrain motorized vehicles within selected areas of the dunes and on the beaches through February, 1994, for beach surveys and placement of permanent survey monuments to continue these efforts.

In accordance with Martin County Code 33-72 (I) Special Barrier Island Regulations - Beach/Dune Protection; and Section 8-4, Coastal Management Element of the County's Comprehensive Plan, motorized vehicles are prohibited from operation on the beach and primary dune system. An exception is provided for emergency situations or as approved by special permit from the FDEP, and the Board.

Staff recommends this permission be granted. This approval will not release the USACOE from also obtaining the necessary FDEP approvals for this work.

9. RECOMMENDED ACTION:

Staff recommends the Board of County Commissioners approve the use of motorized vehicles on the beach areas by the USACOE, in accordance with Martin County Code 33-72 (I) Special Barrier Island Regulations - Beach/Dune Protection, and Section 8-4 of the Comprehensive Plan, through February, 1994 for work associated with the Martin County 4-Mile Beach Renourishment Project.

DEPT.DIR	PSD	BZD	GMD	PWD	ENG	UTD	BUD	PRD	ACA	CTY ADM	CTY ATTNY
X			X		X				X	X	X

cc: DRD
R.M.
C.S

NOV-17-'93 WED 16:37 ID:FL/DNR-BEACH&SHORE TEL NO:904/488-5257 #258 P01

Florida Department of
Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

November 17, 1993

VIA FACSIMILE: (904) 232-1213

Rick McMillen
Office: CESAJ - DP - I
Department of the Army
Jacksonville Dist. Corp. of Engineer
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. McMillen:

A permit is not required from this office to operate all-terrain vehicle (ATV) equipment seaward of the coastal construction control line providing:

1. An access point is available that will not adversely impact the dune or the vegetation thereon.

2. No operation of vehicles during night time hours.

3. All driving is performed at the wet sandy beach area.

This letter does not relieve any responsibility to comply with all applicable federal, state, county and municipal laws, ordinances or rules, nor does it relieve any responsibility to obtain any other license or permits which may be required by federal, state, county or municipal law. If you have any questions concerning this matter, please telephone me at (904) 487-4475.

Sincerely,

James D. Christie, Engineer II

JDC/ss

Printed on recycled paper

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

November 17, 1993

Programs and Project Management Division
Project Management Branch

Mr. J.D. Christie
Division of Beaches and Shores
Mailstation 310
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Dear Mr. Christie:

This letter is to request a **NOTICE OF EXEMPTION** for use of all-terrain vehicle (ATV) equipment on the Martin County beaches. These vehicles are needed to assist in obtaining beach surveys required for the Martin County shore protection project.

Thank you for your assistance. If you need further information, please contact the project manager, Mr. Rick McMillen, at 904-232-1231.

Sincerely,

for Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

MARSHAL L. WILCOX
District 1

JEFF KRAUSKOPF
District 2

JANET K. GETTIG
District 3

MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

PHONE (407) 288 5400

COUNTY OF MARTIN STATE OF FLORIDA

November 5, 1993

ENG-CI-94-041L

Mr. Richard Bonner, P.E.
Deputy District Engineer for
Project Management
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Re: Martin County 4-Mile Beach Renourishment/Shore Protection
Martin County Project #93E-CP-004
Project Cooperation Agreement

Dear Mr. Bonner:

We have received Mr. Hal Graff's July 1, 1993 letter concerning the need to execute a Project Cooperation Agreement (PCA) for the Martin County Shore Protection Project. With the rapidly approaching 1994-95 construction schedule, it is important to prepare this agreement as soon as possible.

The County is committed to project construction in the 1994-95 FY, and understands that a 6-9 month period is anticipated for drafting and executing the agreement. Therefore, in accordance with Public Law 91-611 Section 221 of the Flood Control Act of 1970, Martin County requests that the USACOE begin work to draft the PCA document.

We are aware that the General Design Memorandum will be needed to finalize the cost-sharing requirements for the project, and that this information will also be a provision within the PCA. However, We do not believe this information should delay initiating preparation of the PCA.

Please contact me at 407-288-5927 if you need any further information, or if you would like to coordinate a meeting with the County pertaining to this matter.

Sincerely,

Donald E. Holloman, P.E.
County Engineer

DEH:LAW:djs

cc: Karyn Erickson, Applied Technology & Management

s:\cip\94let\ci041l

APPLIED TECHNOLOGY AND MANAGEMENT, INC.
502 N.W. 75 STREET, SUITE 95
GAINESVILLE, FLORIDA 32607
TELEPHONE: (904) 375-8700 • FAX (904) 375-0995

August 13, 1993

Ms. Marlene Stern
Florida Department of
Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Martin County Beach Nourishment Project
DEP File No. 432336109

Dear Marlene:

Attached please find our response to the RAI dated July 26, 1993, regarding the above referenced project. Please note that we are not yet able to provide a response to each item, however, these items will be addressed in subsequent submittals.

Please feel free to call me if you require clarification of any of these items.

Sincerely,

Janet K. Heam, P.E.

JKH/rkl

Attachments

cc: John Abendroth, FDEP (w/attachments)
Rick McMillen, USACOE (w/o attachments)
Don Holloman, Martin County (w/o attachments)
Lee Weberman, Martin County (w/o attachments)
Karyn Erickson, ATM (w/attachments)

ATM'S RESPONSE TO
FDEP RAI DATED JULY 26, 1993

Item 1: **Please provide 8.5 by 11 inch plan view drawings of the project that show all of the following items:**

a. **Erosion Control Line (ECL);**
b. **DNR reference monuments;**
c. **Existing mean high water line (if different from ECL);**
d. **Construction toe of fill;**
e. **Equilibrium toe of fill including the configuration of downdrift fill as far as it is expected to occur;**
f. **Location of any stormwater outfalls, derelict structures or groins;**
g. **Location of sediment samples discussed in Item 7; and**
h. **Hardbottom within (landward) of the equilibrium toe (including downdrift fill) and at least 300 meters beyond the equilibrium toe of fill.**

Response: Items 1b, 1c, 1d, and 1g were included in Sheets 2 through 5 of 31 in the original permit application. The survey work for Item 1a, the proposed ECL, is presently being conducted and will replace Item 1c in future submittals. Items 1e, 1f, and 1h are in preparation. Complete plan view drawings will be forwarded when all items have been completed.

Item 2. **To the cross-sections, please add the equilibrium toe of fill and ECL.**

Response: The equilibrium toe of fill and the ECL are in preparation. Complete cross-section drawings will be forwarded when this information is available.

Item 3: **Please provide two sets of recent aerial photographs of the project area and indicate when the photographs were taken. On these photographs, please show the information requested in Question 1 and limits of public beaches.**

Response: This item is in preparation.

Item 4: **Please provide several representative cross sections of the borrow site that indicate existing and proposed contours; half of the cross sections should be oriented perpendicular to the shore and half parallel to the shore. These diagrams should be in 8.5 by 11 inch format, certified by a professional engineer, have appropriate scale bars (the vertical scale bars referenced to NGVD) and reference the Florida rectangular plan coordinate system.**

Response: We are in the process of working with the USACOE to refine the limits of the borrow area. The requested representative cross sections will be forwarded when this analysis is complete.

Item 5: **Please describe the construction methods that will be used for the project and provide a construction time table. This description also should include an estimate of the longevity of the renourished beach and the anticipated frequency of renourishment events.**

ATM'S RESPONSE TO
FDEP RAI DATED JULY 26, 1993

Response: The method of construction is usually determined by the contractor. Specification of equipment types or methods by the Corps of Engineers may be seen as a restriction on bidders and is not done under normal circumstances. Contractors are required to meet all applicable State and Federal water quality standards and any special conditions of the Water Quality Certification regardless of equipment type or method used. Transportation of beach fill and placement of pipe will be determined by the contractor based on conditions at the time of construction. Once again, regardless of what equipment or method is used, the contractor must meet all applicable water quality standards.

Item 6: **Please provide core boring logs and sediment grain size analysis from throughout the borrow area. Logs should extend at least two feet below the proposed bottom elevation. The depth of each visible horizon in the log should be reported relative to MSL and the material in each horizon classified according to the Unified Soil Classification System. Gradation curves should be produced from sieve analysis of each visible horizon in the core. Grain size distributions must be determined down to the standard unit 200 sieve size. Based on the sampling results, please provide an estimate of the volume of beach quality sand within the borrow area.**

Response: Core boring logs and grain size analyses are attached. A summary of the sample locations (State Plane Coordinate System) is also included. Please note that the core boring logs for CB-M-2 and CB-M-22A cannot be located.

Item 7: **Please provide sediment samples from the beach renourishment site. The samples should be collected to represent the range of substrate types present and to be used in a grain size compatibility analysis.**

Response: In order to determine the composite grain-size characteristics for the native beach material on Hutchinson Island, a beach and nearshore sediment investigation was conducted. Samples were collected at designated elevations along eight transects running perpendicular to the shoreline. The FDNR monument locations included: R-1, R-4, R-7, R-11, R-15, R-20, and R-24. Samples were collected from the following elevations (in feet relative to NGVD): +10, +5, 0, -5, -10, -15, and, where possible, -20. The results of grain size analyses of the beach sand samples are attached.

Item 8: **Please provide a compatibility analysis of the beach and borrow sands. Please include composite graphs of the grain size distribution of the beach and borrow materials in your analysis.**

Response: The compatibility analysis and composite graphs will be prepared after the final borrow area configuration is determined. We are presently working with the USACOE to finalize the borrow area.

Item 9: **Please provide an assessment of the biological resources at the beach site (including any nearby areas that may be affected by the project) and the borrow area (including any nearby areas that may be affected by removing the material). This assessment should include:**

ATM'S RESPONSE TO
FDEP RAI DATED JULY 26, 1993

Item 9a. **Maps that identify the location and characterize the functions of any seagrass, other aquatic vegetation, rock outcrops, coral reefs, worm reefs, shellfish beds, sea turtle nesting sites, habitat used by endangered birds or beach mice, artificial reefs (or shipwrecks), and any other significant biological features within 300 meters of the beach or borrow areas. A description of methods used to locate and characterize resources must be provided. A side-scan survey of the borrow and fill areas and the area downdrift of the fill area where sedimentation is expected to occur must also be provided.**

Response: This item is in preparation.

Item 9b. **Benthic surveys of the renourishment and borrow areas that accurately describe the species present, relative density, and community structure within the areas. For this purpose, the benthic community should be defined as those organisms retained be a 500 micron sieve. At the borrow area, the epibenthic macrofauna must also be characterized. Please submit sampling plan for approval before beginning the field work.**

Response: Benthic sampling was conducted at the proposed project fill site, the project borrow area, and control areas in May/June 1990. A total of four transects were sampled for the benthic assessment. Two transects were within the limits of the proposed nourishment project at R-6 and R-19. In addition, two control transects were established- one to the north and one to the south of the nourishment boundaries. Along each transect, four sampling stations were established at regular intervals perpendicular to the beach face. Seven replicates were collected at each station.

Four stations corresponding to core boring locations were surveyed within the borrow area M-7, M-8, M-12, and M-16. Four control locations at M-3A, M-6, M-14, and M-21 were also surveyed. Seven replicates were collected at each station.

These samples are awaiting analysis. Per ATM's discussions with the DEP, the following samples will be analyzed:

Fill Area

South Control Transect: 3 stations, no more than 5 replicates;
Transect R-6: 3 stations, no more than 5 replicates; and
Transect R-19: 3 stations, no more than 5 replicates.

Borrow Area

Four borrow site stations, no more than 5 replicates.
Two control stations, no more than 5 replicates.

The results of the benthic sample analysis will be forwarded to the DEP when the analysis is complete.

ATM'S RESPONSE TO
FDEP RAI DATED JULY 26, 1993

Item 9c. **A general description of all commercial and recreational fisheries and the recreational skin and SCUBA diving within 1 mile of the beach and borrow sites. Please also discuss the extent to which nearshore rock outcrops are visited by divers and snorkelers.**

Response: A discussion on this item is attached.

Item 10: **Please indicate the amount of storm protection provided by the current beach and the amount expected to be provided by the new beach. This estimate also should include an approximate value of the public and private lands benefiting from the additional protection.**

Please submit the 1989 report by the Corps which updates the project recreation benefits, cost estimates and fill volumes. If additional analysis of benefits and fill have been done more recently, please submit that.

Response: The 1991 Economic Update is attached.

The existing beach provides little to no storm protection. The project as planned will provide protection from a 10 to 15-year storm event.

The value of properties provided storm protection benefits as calculated by the Corps includes only the first row ocean front structures (first two floors only). This approximate property value is $64.4 million. The total value of property fronting the project area is $125 million.

A March 1992 update to the Corps' 1989 report is attached.

Item 11. **Please provide detailed plans for protecting water quality and biological resources during construction. At a minimum, this plan should explicitly address turbidity controls and a discussion of the status of the sea turtle nest-relocation plan that has been submitted to DNR.**

Response: The construction contractor will be required to comply with all local, State, and Federal water quality standards and any special conditions of the Water Quality Certification. We are presently in the process of preparing a request for a water quality variance. The petition for variance will be submitted as soon as our analyses are complete.

Construction will not occur during turtle nesting season.

Item 12a: **Please provide a description of the beach's geologic history and any major periods of accretion or erosion.**

Response: This item is in preparation.

Item 12b: **Please provide information specifying current erosion rates and areas of influence.**

Response: This item is in preparation.

ATM'S RESPONSE TO
FDEP RAI DATED JULY 26, 1993

Item 12c: **Please provide monthly wave direction, height, and energy.**

Response: A summary of the local wave conditions is attached. This summary is excerpted from the draft inlet management plan for St. Lucie Inlet dated April 28, 1992.

Item 12d: **Please provide monthly nearshore current speeds and directions.**

Response: We are not aware of any current studies that provide information on nearshore currents within the project area, however, a summary of the current conditions in and around St. Lucie Inlet was prepared for the St. Lucie Inlet Management Plan. This summary (attached) is excerpted from the draft inlet management plan for St. Lucie Inlet dated April 28, 1992.

Item 12e: **Please provide monthly littoral drift direction and volumes.**

Response: A table summarizing monthly littoral drift based on Walton (1973) is attached.

Item 12f: **Please provide location of any nodal points within the proposed nourishment area.**

Response: There are no nodal points within the proposed nourishment area.

Item 12g: **Please provide an estimate of the depth of closure if the borrow area is offshore of the beach in less than 25 feet of water.**

Response: Nearly all of the borrow area is in 25 to 35 feet of water.

APPLIED TECHNOLOGY AND MANAGEMENT, INC.
502 N.W. 75 STREET, SUITE 95
GAINESVILLE, FLORIDA 32607
TELEPHONE: (904) 375-8700 • FAX (904) 375-0995

August 10, 1993

Mr. Mickey Bryant, Administrator
Intergovernmental Coordination
Department of Environmental Protection
3900 Commonwealth Boulevard
Mail Station 46
Tallahassee, Florida 32399-3000

RE: Martin County 4-Mile Beach Nourishment Project

Dear Mr. Bryant:

I am writing to provide you with a status report on the Martin County Beach Nourishment Project. A current timeline schedule prepared jointly by Applied Technology and Management, Inc., (ATM) and the U.S. Army Corps of Engineers is attached for your review and comments. The timeline establishes critical milestones that must be met in order to assure that all work is completed to accomplish the accelerated 1994-95 construction time frame.

On behalf of Martin County, ATM is working closely with the U.S. Army Corps of Engineers to assist in completing all design work and environmental investigations that are required to complete the General Design Memorandum in December 1993. In addition, ATM is working concurrently with Robert Brock of the USACOE to formulate a hardbottom mitigation plan as well as to coordinate the County's responses to the BWRM completeness summaries.

Since our last meeting (December 1992), the USACOE and ATM coordinated investigations for characterization of the nearshore habitats, including benthic and fisheries communities. Specificall,y this work included magnetometer surveys, side scan sonar surveys, hardbottom mapping, groundtruthing, and nearshore habitat characterization studies. These investigations were performed in close cooperation with representatives of the USFWS, DER, and DNR to determine the extent, character, and locations of hardbottom areas adjacent to the Project's fill and borrow areas in order to develop a plan for mitigating anticipated impacts to hardbottom habitats, fisheries and other coastal resources in the Project area.

ATM is presently working with Ms. Marlene Stern and Mr. John Abendroth of the Bureau of Wetland Resource Management (BWRM) to provide additional information to process the BWRM permit. The development of the draft hardbottom mitigation plan is expected to be completed in mid-August. ATM and the USACOE are planning to meet to discuss the completeness summaries, biological mitigation plan, and the final recommended project design (i.e., NED Plan) with representatives of the BWRM and the Division of Beaches and Shores (DBS) during the first week of September.

Martin County would like to arrange a meeting with you following the above-described agency meetings to discuss the County's application for Federal funds to construct this Project in the 1994-95 fiscal year. If a particular week is preferable to you, please advise me as soon as possible in order that we may coordinate arrangements for this meeting with the USACOE, BWRM, DBS, and Martin County.

As you know, the Martin County Beach Nourishment Project is a top priority of the Martin County Board of County Commissioners, the State of Florida, and the U.S. Army Corps of Engineers. We greatly appreciate your continued cooperation and assistance in the execution of this important Project.

Sincerely,

APPLIED TECHNOLOGY AND MANAGEMENT, INC.

Karyn M. Erickson, P.E., Vice President

KME/rkl

Enclosure

cc: Don Holloman, County Engineer, Martin County
Richard McMillen, U.S. Army Corps of Engineers
Lonnie Ryder, Division of Beaches and Shores

USACOE AND ATM TASKS SCHEDULE

MARTIN COUNTY SHORE PROTECTION PROJECT

Task Item	Start-End Dates
USACOE	
Obtain Structure and Land Values	April 5, 1993 – May 5, 1993
Obtain Cost Estimates Alternatives	August 5, 1993 – August 18, 1993
Side Scan Survey and Write-Up	May 19, 1993 – July 4, 1993
Inspection of Hardbottoms	July 9, 1993 – July 23, 1993
Storm Damage Model Preparation	July 29, 1993 – August 3, 1993
Development of Mitigation Plan	July 29, 1993 – August 12, 1993
Benthic and Fish Inventory	July 29, 1993 – August 11, 1993
Damage Benefit Calculations	August 12, 1993 – August 18, 1993
Evaluate Alternate Plans	August 19, 1993 – August 25, 1993
Develop NED Plan	August 26, 1993 – August 27, 1993
Determine Cost Sharing	August 26, 1993 – September 9, 1993
ATM	
Respond to DEP-BWRM RAI #1	July 28, 1993 – August 13, 1993
Review and Comments on Draft COE Mitigation Plan	August 16, 1993 – August 25, 1993
Obtain Construction Easements	September 15, 1993 – April 30, 1994
Prepare and Submit DSL-DSB Permit Applications	September 15, 1993 – September 24, 1993
Meeting with DEP-BWRM to Discuss Hardbottom Mitigation Plan and Project Design	August 30, 1993 – September 3, 1993
Refine Borrow Area and Meet with COE	September 13, 1993 – September 17, 1993
Meeting with Mickey Bryant	September 13, 1993 – September 17, 1993
Respond to DEP-BWRM RAI #2	September 15, 1993 - September 30, 1993
Review Draft GDM	November 15, 1993 – December 1, 1993
Coordinate GDM Review--Meet w/USACOE-SAD	January 1994
Obtain Final Approval of GDM from Chief of Army (Washington, D.C.)	March 1994
Complete DEP-BWRM Permit Processing	May 1994
Complete DEP-DBS Permit Processing	July 1994
Complete DEP-DSL Permit Processing	July 1994
Obtain PCA (Local Cooperative Agreement)	July 1, 1994 -- October 1, 1994
Prepare Construction Bidding Documents	October 1, 1994 – November 30, 1994

DATES shown on District Executive Summary Plan

RESPONSIBILITIES OF SOME OF THESE ACTIVITIES.

SOME OF THE ACTIVITIES MUST BE TAKEN w/ATM AND SEMINOLE TRIBE

APPLIED TECHNOLOGY AND MANAGEMENT, INC.
502 N.W. 75 STREET, SUITE 95
GAINESVILLE, FLORIDA 32607
TELEPHONE: (904) 375-8700 • FAX (904) 375-0995

July 8, 1993

Mr. Robert Brock
U.S. Army Corps of Engineers
Environmental Branch
P.O. Box 4970
Jacksonville, FL 3223209918

RE: Martin County Environmental Ground Truthing

Dear Robert,

It is our understanding that the groundtruthing of the side-scan survey for Hutchinson Island is scheduled to begin on Tuesday July 13, 1993 and proceed through July 23rd. In order for the County to arrange and pay for the proper-sized boat and equipment and to ensure adequate agency representation, we had previously requested a confirmation list of the individuals who are scheduled to dive, and a list of any dive equipment that must be rented. To date, neither the County nor ATM has been provided with this information. Because we have not heard from you and have not been able to contact you, ATM has made the following arrangements for next week's trip:

1. Morgan and Eklund Surveyors will provide positioning for the dives using their HYDRO positioning system. HYDRO is accurate to within three feet; this is substantially better than the accuracy of the GPS, which I understand to be within 2 to 5 meters. Morgan and Eklund will be setting the ground stations for the positioning system tomorrow, July 9th. In order to have sufficient lead time for this setup, we have had to assume that the first portion of the survey work will be conducted within the 4.5-mile project area beginning at the north Martin County line. Therefore, please plan your dives accordingly.

2. We have two dive boats for a total of nine work days- July 13-16 and July 19-23. Together the boats will accommodate a total of nine divers. If you anticipate more than nine divers on any particular day, please let us know as soon as possible so that we can look into arranging for a third boat. We are at present anticipating to have five divers on the first day of groundtruthing. This includes three divers from the USACOE, one diver from U.S. Fish and Wildlife, and Karyn Erickson from ATM. We are planning for a start time of 7:30 a.m. from the public boat ramp (Sandsprit Park) in Stuart.

Please note that no arrangements have been made for dive equipment rental.

In order for the surveyors and ATM to make your dives as productive and efficient as possible, we request that you provide as soon as possible a description of your dive plan (e.g., approximate state plane coordinate positions of dive sites and transect locations; number of groundtruthing sites; length, orientation, and number of transects; boundaries of area to be ground truthed, etc.). Rick McMillen is forwarding copies of the draft side scan survey maps to John Morgan in Vero Beach; it would be helpful for you to contact him at 407-569-2218 to discuss the approximate locations of your intended dives. By

Mr. Robert Brock
July 8, 1993
Page 2

knowing these locations in advance, the Morgan and Eklund crew can "pre-inspect" the areas and mark them with buoys for easy relocation later.

Finally, it is our present understanding that the U.S. Fish and Wildlife Service will be diving with you during the first and second week and that the Florida DEP will have at least one representative during the second week. We feel that it is also essential to have a representative from the Division of State Lands. Will a representative from State Lands be present for any of the dives?

I hope that these arrangements are satisfactory. I will be out of the office until Wednesday July 14, however, you can reach Karyn Erickson in Gainesville at 904-375-8700 to finalize these arrangements or if you have any questions.

Sincerely,

APPLIED TECHNOLOGY AND MANAGEMENT, INC.

Janet K. Hearn

Janet K. Hearn

JKH/saw

cc: Karyn Erickson, ATM
Lee Weberman, Martin County
Bonnie Dearborn, Martin County
Robert Cutcher, ATM
John Morgan, Morgan and Eklund
Rick McMillen, USACOE

447

440

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BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN STATE OF FLORIDA

June 29, 1993

Mr. Richard Bonner, Deputy District Engineer
Programs and Project Management
P.O. Box 4970
Jacksonville, Florida 32202

Dear Mr. Bonner:

First, I want to thank you for all the help you have provided Martin County in obtaining the Congressional appropriations to date in the amount of $600,000 towards the Martin County 4-Mile Beach Nourishment Project . These funds would not have been possible had the ACOE not provided us with necessary support throughout the Congressional appropriations process. We are very grateful for your help.

We appreciate your continued support on the project and are pleased that the FY '94 appropriations in the amount of $282,000 has recently passed the House Appropriations Committee on Energy and Water and is on its way to the floor. In addition to the FY '95 funding to complete the PED portion of the project, we are asking our Congressmen to do an "add-on" to the FY '95 budget for the construction funds in the amount of $6,167,757 in order to meet the expedited schedule that has been agreed upon by the various agencies involved in the project. We understand the ACOE is doing all that it can to assist us in this effort and we are very grateful for the ACOE's strong support.

Attached for your information are copies of correspondence sent to certain Members of the Florida Congressional Delegation and copied to the Florida Department of Natural Resources regarding this project.

As you know the 4-Mile Beach Nourishment Project on Hutchinson Island, Martin County is a top priority for the Martin County Board of County Commissioners. It is essential that we receive state and federal funding in 1994 in order to meet the expedited schedule. Our staff has been working very closely with the ACOE and the state agencies to achieve the necessary tasks in time to meet the required deadlines to accomplish an "add-on" to the federal budget.

Again, we thank you for all your help and will appreciate your continued strong support for the project..If there are any questions, please do not hesitate to contact us at SC 239-1357.

Yours truly,

Jeff Krauskopf,
Chairman

ADM-IG-93-142L
cc: Peter Cheney, Assistant County Administrator

Addendum:
Attached is another copy of Martin County's Resolution #92-11.11C requesting ACOE to assist in expediting the beach project.

VICE CHAIRMAN
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SUE B. WHITTLE • County Administrator

PHONE (407) 286-5422

COUNTY OF MARTIN STATE OF FLORIDA

June 28, 1993

COM-93-CHR-034

The Honorable Porter Goss
United States House of Representatives
330 Cannon House Office Building
Washington, D.C. 20515

Dear Congressman Goss:

This correspondence is a request for your assistance in seeking federal funding for an important beach restoration project in Martin County. Being a coastal county in Florida it has become necessary to seek financial assistance in order to restore our beach for storm protection purposes. The situation has become so serious that it is necessary to expedite the beach construction schedule by one year. I am writing you at this time to ask for your assistance in getting construction funds in the amount of **$6,167,757** for Martin County's 4-mile beach nourishment project "added-on" to the federal budget for FY '95, and to inform you of the current and projected activities relating to our project.

Update Report

For the past several years Martin County has been seeking federal funding to construct a 4-Mile Beach Nourishment project on Hutchinson Island in Martin County. In November 1992 the Martin County Board of County Commissioners, representatives of state and federal agencies agreed there was a very serious need to expedite the construction of the project by one year, that is, to begin beach nourishment construction in November 1994 rather than 1995. The Board adopted a Resolution to that effect, a copy of the Resolution is attached. Since November, County staff has been working closely with the appropriate state and federal agencies in order to complete the necessary tasks in time to meet the expedited schedule.

Federal, State and County Support

The estimated total cost of the Martin County 4-Mile Beach Nourishment project is between $ 13-15 million. To date, the federal government has appropriated $600,000 towards the Preconstruction and Engineering Design (PED) portion of the project, and has placed $282,000 into the federal FY '94 budget, also for the PED phase. The 1993 Florida Legislature appropriated $421,592 towards preconstruction portion of the project to assist us in our accelerated schedule.

When the Florida Legislature meets in February/March 1994 for its Regular Legislative Session, Martin County will be requesting the State to appropriate its cost share for the beach construction in the amount of $6,703,640. The Florida Department of Natural Resource has placed our beach project as its No. 1 "top priority" project for beach construction funds for this amount. It is crucial that the federal construction funds are "in place," that is, in the federal budget for FY '95 in order for the State to appropriate its share. This is very important because in a state/federally funded project the State requires that the Federal match be available before the State will appropriate its funds.

On June 8 the Martin County Board of Commissioners adopted an ordinance to levy Special Beachfront Assessments to assure the availability of the County's source of funding as the local sponsor. Martin County's cost share is estimated at $2,800,000.

Funding Glitch

Due to the Army Corps of Engineers' (ACOE) 2-year budget cycle and their policy and procedure rules, the ACOE will not have our beach construction funds in its FY '95 budget in time for the State to appropriate its funds. According to the ACOE, a project is not ready to be put into its budget until the project has been "completed and ready to go." Due to the serious efforts that the state agencies and the ACOE have been making to complete the necessary steps for receipt of construction funds, the Martin County 4-Mile Beach Nourishment project will *technically* be "ready to go" in time for the State to appropriate its share. That is, all the required work would have been completed by the state and federal agencies, except, for the final review by the ACOE's Headquarters. There is attached for you a graph which lays out the timelines for funding of the project on the accelerated schedule and the events that must occur for the project to begin construction in November 1994.

"Add-On" Assistance

Because our project will be *technically* completed in time for the State to appropriate it share of the construction funds, we are requesting members of our Congressional Delegation to pursue getting the project construction funds "added-on" to the federal budget for FY '95. Congressman Tom Lewis has agreed to initiate the "add-on." This will have to be accomplished in January-February 1994 to meet the State's required match. The ACOE has assured us the Project Design Document will have been completed by January 1994 and will be available to our Congressmen at that time. It is the document needed to assist in accomplishing the "add-on" to the federal budget for FY '95.

We will need your strong support to accomplish the "add-on," and are asking you to provide us with your help and assistance on this matter. We realize there will be a great deal of competition for the appropriated discretionary funds, which is why we know this cannot be achieved without your commitment to this effort. Bonnie Dearborn is planning to meet with you at your District office a to familiarize you with the project in the near future. Please do not hesitate to contact us if you have any questions regarding this project at 407-221-1357

Yours truly,

Jeff Krauskopf
Chairman

ADM-IG-93-139L

cc: Congressman Tom Lewis, District 16
Richard Bonner, Army Corps of Engineers
Kirby Greene, The Florida Department of Natural Resources
Peter Cheney, Acting County Administrator

VICE CHAIRMAN
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BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE, County Administrator

COUNTY OF MARTIN STATE OF FLORIDA

June 28, 1993

COM-93-CHR-034

The Honorable Bob Graham
United States Senate
Washington, D.C. 20510

Dear Senator Graham:

This correspondence is a request for your assistance in getting construction funds in the amount of **$6,167,757** for Martin County's 4-mile beach nourishment project "added-on" to the federal budget for FY '95, and to update you on the current and projected activities relating to our project.

Update Report

In December 1992 Bonnie Dearborn, our Intergovernmental Specialist, met with your staff in Washington to advise you of Martin County's interest to expedite the 4-Mile Beach Nourishment project on Hutchinson Island in Martin County after the Martin County Board of County Commissioners, representatives of state and federal agencies agreed there was a very serious need to expedite the construction of the project by one year, that is, to begin beach nourishment construction in November 1994 rather than 1995. The Board adopted a Resolution to that effect, a copy of which was provided to your office. Since that time County staff has been working closely with the appropriate state and federal agencies in order to complete the necessary tasks in time to meet the expedited schedule.

Federal, State and County Support

The estimated total cost of the Martin County 4-Mile Beach Nourishment project is between $ 13-15 million. To date, the federal government has appropriated $600,000 towards the Preconstruction and Engineering Design (PED) portion of the project, and has placed $282,000 into the federal FY '94 budget, also for the PED phase. The 1993 Florida Legislature appropriated $421,592 towards preconstruction portion of the project to assist us in our accelerated schedule.

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We will need your strong support to accomplish the "add-on," and are asking you to provide us with your help and assistance on this matter. We realize there will be a great deal of competition for the appropriated discretionary funds, which is why we know this cannot be achieved without your commitment to this effort.

We will assist you in every way we can. Please do not hesitate to contact us if you have any questions regarding this project at 407-221-1357

Yours truly,

Jeff Krauskopf
Chairman

ADM-IG-93-137L

cc: Congressman Tom Lewis, District 16
Richard Bonner, Army Corps of Engineers
Kirby Greene, The Florida Department of Natural Resources
Peter Cheney, Acting County Administrator

VICE CHAIRMAN
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BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

PHONE 407 288 5422

COUNTY OF MARTIN **STATE OF FLORIDA**

June 28, 1993

COM-93-CHR-034

The Honorable Connie Mack
United States Senate
Washington, D.C. 20510

Dear Senator Mack:

This correspondence is a request for your assistance in getting construction funds in the amount of $6,167,757 for Martin County's 4-mile beach nourishment project "added-on" to the federal budget for FY '95, and to update you on the current and projected activities relating to our project.

Update Report

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"Add-On" Assistance
Because our project will be technically completed in time for the State to appropriate it share of the construction funds, we are requesting members of our Congressional Delegation to pursue getting the project construction funds "added-on" to the federal budget for FY '95. Congressman Tom Lewis has agreed to initiate the "add-on." This will have to be accomplished in January-February 1994 to meet the State's required match. The ACOE has assured us the project design document will have been completed by January 1994 and will be available to our Congressmen at that time. It is the document needed to assist in accomplishing the "add-on" to the federal budget for FY '95.

We will need your strong support to accomplish the "add-on," and are asking you to provide us with your help and assistance on this matter. We realize there will be a great deal of competition for the appropriated discretionary funds, which is why we know this cannot be achieved without your commitment to this effort.

We will assist you in every way we can. Please do not hesitate to contact us if you have any questions regarding this project at 407-221-1357

Yours truly,

Jeff Krauskopf
Chairman

ADM-IG-93-131L

cc: Congressman Tom Lewis, District 16
Richard Bonner, Army Corps of Engineers
Kirby Greene, The Florida Department of Natural Resources
Peter Cheney, Acting County Administrator

MARSHAL L. WILCOX District 1 | JEFF KRAUSKOPF District 2 | JANET K. GETTIG District 3 | MAGGY HURCHALLA District 4 | CHARLENE HOAG District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE-County Administrator

PHONE 407 288 5422

COUNTY OF MARTIN **STATE OF FLORIDA**

June 28, 1993

COM-93-CHR-034

The Honorable Alcee L. Hastings
United States House of Representatives
2701 West Oakland Park Boulevard, Suite 200
Ft. Lauderdale, Florida 33311-1363

Dear Congressman Hastings:

First, I want to take a moment to congratulate you on your successful campaign to become a Member of Congress, and specifically a Member of Martin County's Congressional Delegation. As a Delegation Member, I am writing you at this time to ask for your assistance in getting construction funds in the amount of **$6,167,757** for Martin County's 4-mile beach nourishment project "added-on" to the federal budget for FY '95, and to update you on the current and projected activities relating to our project.

Update Report

For the past several years Martin County has been seeking federal funding to construct a 4-Mile Beach Nourishment project on Hutchinson Island in Martin County. In December 1992 Bonnie Dearborn, our Intergovernmental Specialist, attempted to meet with you or your staff in Washington. It was, however, a time of transition when new Members were not yet settled and, therefore, she was unable to meet with either you or your staff at that time to advise you of Martin County's interest to expedite the 4-Mile Beach Nourishment project.

In November 1992 the Martin County Board of County Commissioners, representatives of state and federal agencies agreed there was a very serious need to expedite the construction of the project by one year, that is, to begin beach nourishment construction in November 1994 rather than 1995. The Board adopted a Resolution to that effect, a copy of the Resolution is attached. Since November, County staff has been working closely with the appropriate state and federal agencies in order to complete the necessary tasks in time to meet the expedited schedule.

Federal, State and County Support

The estimated total cost of the Martin County 4-Mile Beach Nourishment project is between $ 13-15 million. To date, the federal government has appropriated $600,000 towards the Preconstruction and Engineering Design (PED) portion of the project, and has placed $282,000 into the federal FY '94 budget, also for the PED phase. The 1993 Florida Legislature appropriated $421,592 towards preconstruction portion of the project to assist us in our accelerated schedule.

When the Florida Legislature meets in February/March 1994 for its Regular Legislative Session, Martin County will be requesting the State to appropriate its cost share for the beach construction in the amount of $6,703,640. The Florida Department of Natural Resource has placed our beach project as its No. 1 "top priority" project for beach construction funds for this amount. It is crucial that the federal construction funds are "in place," that is, in the federal budget for FY '95 in order for the State to appropriate its share.

This is very important because in a state/federally funded project the State requires that the Federal match be available before the State will appropriate its funds.

On June 8 the Martin County Board of Commissioners adopted an ordinance to levy Special Beachfront Assessments to assure the availability of the County's source of funding as the local sponsor. Martin County's cost share is estimated at $2,800,000.

Funding Glitch

Due to the Army Corps of Engineers' (ACOE) 2-year budget cycle and their policy and procedure rules, the ACOE will not have our beach construction funds in its FY '95 budget in time for the State to appropriate its funds. According to the ACOE, a project is not ready to be put into its budget until the project has been "completed and ready to go." Due to the serious efforts that the state agencies and the ACOE have been making to complete the necessary steps for receipt of construction funds, the Martin County 4-Mile Beach Nourishment project will *technically* be "ready to go" in time for the State to appropriate its share. That is, all the required work would have been completed by the state and federal agencies, except, for the final review by the ACOE's Headquarters. There is attached for you a graph which lays out the timelines for funding of the project on the accelerated schedule and the events that must occur for the project to begin construction in November 1994.

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We will need your strong support to accomplish the "add-on," and are asking you to provide us with your help and assistance on this matter. We realize there will be a great deal of competition for the appropriated discretionary funds, which is why we know this cannot be achieved without your commitment to this effort. Bonnie Dearborn is scheduled to meet with you at your District office on July 23 to familiarize you with the project. Please do not hesitate to contact us if you have any questions regarding this project at 407-221-1357

Yours truly,

Jeff Krauskopf
Chairman

ADM-IG-93-136L

cc: Congressman Tom Lewis, District 16
Richard Bonner, Army Corps of Engineers
Kirby Greene, The Florida Department of Natural Resources
Peter Cheney, Acting County Administrator

VICE CHAIRMAN
MARSHAL L. WILCOX
District 1

CHAIRMAN
JEFF KRAUSKOPF
District 2

JANET K. GETTIG
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MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN **STATE OF FLORIDA**

June 28, 1993

COM-93-CHR-034

The Honorable Carrie Meek
United States House of Representatives
404 Cannon House Office Building
Washington, D.C. 20515

Dear Congressman Meek:

First, I want to take a moment to congratulate you on your successful campaign to become a Member of the Florida Congressional Delegation. You served Florida well as a Member of the Florida House of Representatives, and know that you will serve us even better as a member of Congress. I especially want to congratulate you on your appointment to the House Appropriation Committee, a feat most freshmen attempt but few succeed.

This correspondence is a request for your assistance in getting construction funds in the amount of $6,167,757 for Martin County's 4-mile beach nourishment project "added-on" to the federal budget for FY '95, and to update you on the current and projected activities relating to our project.

Update Report

For the past several years Martin County has been seeking federal funding to construct a 4-Mile Beach Nourishment project on Hutchinson Island in Martin County. In December 1992 Bonnie Dearborn, our Intergovernmental Specialist, met with some members of our Congressional Delegation in Washington to advise Members of Martin County's interest to expedite the 4-Mile Beach Nourishment project. It was, however, a time of transition when new Members were not yet settled and, therefore, she was unable to meet with either you or your staff at that time

In November 1992 the Martin County Board of County Commissioners, representatives of state and federal agencies agreed there was a very serious need to expedite the construction of the project by one year, that is, to begin beach nourishment construction in November 1994 rather than 1995. The Board adopted a Resolution to that effect, a copy of the Resolution is attached. Since November, County staff has been working closely with the appropriate state and federal agencies in order to complete the necessary tasks in time to meet the expedited schedule.

Federal, State and County Support

The estimated total cost of the Martin County 4-Mile Beach Nourishment project is between $ 13-15 million. To date, the federal government has appropriated $600,000 towards the Preconstruction and Engineering Design (PED) portion of the project, and has placed $282,000 into the federal FY '94 budget, also for the PED phase. The 1993 Florida Legislature appropriated $421,592 towards preconstruction portion of the project to assist us in our accelerated schedule.

When the Florida Legislature meets in February/March 1994 for its Regular Legislative Session, Martin County will be requesting the State to appropriate its cost share for the beach construction in the amount of $6,703,640. The Florida Department of Natural Resource has placed our beach project as its No. 1 "top priority" project for beach construction funds for this amount. It is crucial that the federal construction funds are "in place," that is, in the federal budget for FY '95 in order for the State to appropriate its share. This is very important because in a state/federally funded project the State requires that the Federal match be available before the State will appropriate its funds.

On June 8 the Martin County Board of Commissioners adopted an ordinance to levy Special Beachfront Assessments to assure the availability of the County's source of funding as the local sponsor. Martin County's cost share is estimated at $2,800,000.

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Yours truly,

Jeff Krauskopf
Chairman

ADM-IG-93-136L

cc: Congressman Tom Lewis, District 16
Richard Bonner, Army Corps of Engineers
Kirby Greene, Florida Dept. of Natural Resources
Peter Cheney, Acting Co. Administrator

Meek, ADM-IG-93-138L
June 28, 1993
Page 2

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BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN STATE OF FLORIDA

June 28, 1993

COM-93-CHR-034

The Honorable Tom Lewis
The U.S. House of Representatives
Room 2351 Rayburn HOB
Washington D.C. 20515

Dear Congressman Lewis:

This correspondence is in follow-up to the meetings and conversations that have taken place with your office over the past several months regarding Martin County's 4-Mile Beach Nourishment Project. This project, as you know, is Martin County's top priority project. Your assistance in getting construction funds in the amount of **$6,167,757** for Martin County's 4-mile beach nourishment project "added-on" to the federal budget for FY '95 is very important to us in order to meet the accelerated schedule that has been verbally agreed upon by the Martin County Board of County Commissioners, the state and federal agencies involved in the project.

Update Report

In December 1992 Bonnie Dearborn, our Intergovernmental Specialist, met with you in Washington to advise you of Martin County's interest to expedite the 4-Mile Beach Nourishment project on Hutchinson Island in Martin County after the Martin County Board of County Commissioners, and representatives of the state and federal agencies agreed there was a very serious need to expedite the construction of the project by one year, that is, to begin beach nourishment construction in November 1994 rather than 1995. The Board adopted a Resolution to that effect, a copy of which was provided to your office. Since that time County staff has been working closely with the appropriate state and federal agencies in order to complete the necessary tasks in time to meet the expedited schedule.

Federal, State and County Support

The estimated total cost of the Martin County 4-Mile Beach Nourishment project is between $ 13-15 million. To date, the federal government has appropriated $600,000 towards the Preconstruction and Engineering Design (PED) portion of the project, and has placed $282,000 into the federal FY '94 budget, also for the PED phase. The 1993 Florida Legislature appropriated $421,592 towards preconstruction portion of the project to assist us in our accelerated schedule.

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"Add-On" Assistance

Our project will *technically* be completed in time for the State to appropriate it share of the construction funds, which is also the time the "add-on" will be required. We especially need your help to initiate the "add-on" which has already been discussed with you and/or your staff on several occasions. This will have to be accomplished in January-February 1994 to meet the State's required match. The ACOE has assured us the Project Design Document will have been completed by January 1994 and will be available to you at that time. It is the document needed to assist in accomplishing the "add-on" to the federal budget for FY '95. Our Congressional Members are being advised of your initiative and requested to give you as much assistance as possible to make the "add-on" become a reality.

Realizing there will be a great deal of competition for the appropriated discretionary funded projects, we will do everything we can to assist you with the "add-on". We know this can only be achieved with a strong commitment by everyone involved. Please do not hesitate to contact us if you have any questions regarding this project. I can be reached at 407-288-5421 or -221-1357

Yours truly,

Jeff Krauskopf
Chairman

ADM-IG-93-135L

cc: Richard Bonner, Army Corps of Engineers
Kirby Greene, Florida Department of Natural Resources
Peter Cheney, Acting County Administrator

4-MILE BEACH NOURISHMENT PROJECT

ACCELERATED SCHEDULE

FEDERAL/STATE STATUS ACTION NEEDED

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
		1993							1994										
7		To Date	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
8	F-AppropriatedPEDFunds-600K																		
9	S-AppropriatedPEDFunds-421K																		
10	MC-Authorized Local Fund Source																		
11	F-Seek FY '94 PED Funds-282K																		
12	F-Approv FY '94 PED Funds-282K																		
13	F-AppropriateFY'94PEDFunds-282K																		
14	F-ACOE to FOMB FY '95-Final PEDFunds																		
15	S-DER to FOMB, FPWP FY '95 Const6M																		
16	S-FDNR budget Const-6M+																		
17	S-Gov Budget S Const-6M+																		
18	F-ACOE Testify Cong FY'95FinalPEDFunds																		
19	S-FDER/FPWP FY '95 to Cong Const-6M																		
20	F-ACOE Complete Design Doc Const-6M																		
21	F-Cong Delg Seek "Add-On" Const-6M																		
22	1994 FL Legislative Session																		
23	F-Cong PreApprov"Add-On" Const-6M																		
24	F-Cong Approve FY '95 Final PEDFunds																		
25	F-Cong Approve "Add-On" Const-6M																		
26	F-AppropriateFY'95FinalPEDFunds																		
27	F-AppropriateConst-$6,167,757																		
28	S-AppropriateConst-$6,703,640																		
29	MC-AppropriateConst-$2,800,000																		
30	Construction Begin																		
31																			
32	ACOE =Army Corps of Engineers	F=Federal						FOMB= federal Office of Management and Budget									For readability		
33	"Add On"=appropriation added to federal budget	FPWP=Florida Public Works Program						PED= Preconstruction Engineering and Design Funds											
34	Const=Construction	FY '94 PED=282K						S=State									Funds Appropriated		
35	FDER=Department of Environmental Protection	FY '95 PED= 263K						6M= ($6,167,757) Federal share Const Funds											
36	FDNR= Department of Natural Resources	MC=Martin County						6M+= ($6,703,640) State Share Const Funds									Actual Construction		

BEFORE THE BOARD OF COUNTY COMMISSIONERS
MARTIN COUNTY, FLORIDA

RESOLUTION NO. 92-11.11c

HUTCHINSON ISLAND BEACH NOURISHMENT PROJECT

WHEREAS, the shoreline of Hutchinson Island, Martin County Florida has experienced acute beach erosion from the St. Lucie County line and extending south for four miles into Martin County over the last several years due to severe weather conditions, and placing many properties of beach front property owners in serious jeopardy, and

WHEREAS, a stabilized dune system along the shoreline would provide the badly needed protection for the beach front property owners that would be established by the nourishment of the beach from the St.Lucie County line four miles south into Martin County, and

WHEREAS, the residents of Martin County and the Board of County Commissioners are in unanimous agreement to expedite the project as early as possible in order to prevent further shoreline erosion of the beach front properties, and

WHEREAS, the Martin County Board of County Commissioners and the residents of Martin County have pledged support for the beach nourishment project by agreeing to provide the necessary local share through ad valorem taxes and special assessments, and

WHEREAS, continued erosion will only increase the costs of the project for the taxpayers, local, state and federal governments as well as cause increased anguish and despair to the shoreline property owners,

NOW, THEREFORE, BE IT RESOLVED that the Martin County Board of County Commissioners urgently requests the Army Corps of Engineers do everything they can to expedite the project by completing the PED portion of the project in time to accommodate a new construction start in FY 1995, and by working closely with the Florida Congressional Delegation, other Congressional Members, as well as all the state and federal agencies necessary to get the Hutchinson Island 4-mile beach nourishment project ready for construction in FY 1995.

DULY PASSED AND ADOPTED this 3rd day of November, 1992.

ATTEST;

MARSHA STILLER, CLERK

BOARD OF COUNTY COMMISSIONERS
MARTIN COUNTY, FLORIDA

MARY DAWSON, CHAIRMAN

APPROVED AS TO FORM AND
CORRECTNESS;

NOREEN S. DREYER
COUNTY ATTORNEY

ADM-1G-93-034M

BEFORE THE BOARD OF COUNTY COMMISSIONERS
MARTIN COUNTY, FLORIDA

RESOLUTION NO. 92-11.11a

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WHEREAS, the residents of Martin County and the Board of County Commissioners are in unanimous agreement to expedite the project as early as possible in order to prevent further shoreline erosion of the beach front properties, and

WHEREAS, the Martin County Board of County Commissioners and the residents of Martin County have pledged support for the beach nourishment project by agreeing to provide the necessary local share through ad valorem taxes and special assessments, and

WHEREAS, continued erosion will only increase the costs of the project for the taxpayers, local, state and federal governments as well as cause increased anguish and despair to the shoreline property owners,

NOW, THEREFORE, BE IT RESOLVED that the Martin County Board of County Commissioners urgently requests Members of the Martin County Congressional Delegation to assist Martin County in expediting the 4-mile beach nourishment project for construction in FY 1995 by directing the Army Corp of Engineers to complete the Preliminary Engineering and Design (PED) in time to accommodate the new construction start time frame, and to continually work closely with all the other state and federal agencies and congressional committees necessary to get the 4-mile beach nourishment project ready for construction in FY 1995.

DULY PASSED AND ADOPTED this 3rd day of November, 1992.

ATTEST;

MARSHA STILLER, CLERK

BOARD OF COUNTY COMMISSIONERS
MARTIN COUNTY, FLORIDA

MARY DAWSON, CHAIRMAN

APPROVED AS TO FORM AND
CORRECTNESS;

for NOREEN S. DREYER
COUNTY ATTORNEY

ADM-IG-93-037M

FYI...
Pbn

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

PFN: 931280

May 7, 1993

In Reply Refer To:
Susan Hammersten
Compliance Review
Section, DHR
(904) 487-2333

Mr. A.J. Salem, Chief
Planning Division
Environmental Resources Branch
USACOE, Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Draft: A Cultural Resource Magnetometer Survey for a Proposed Borrow Area, Martin County, Florida
Wes Hall, April, 1993

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced report, and find it to be complete and sufficient. We note that no magnetic anomalies indicative of historic resources were located during the survey.

Therefore, on the basis of the negative findings, it is the opinion of this agency that the proposed offshore borrow areas for the Hutchinson Island Beach Renourishment project are unlikely to affect any properties listed, or eligible for listing, in the National Register. The project may proceed without further involvement with this agency.

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,

Laura A. Kammerer

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Ash

465

458

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

March 10, 1993

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

Dear Mr. Salem:

Martin County Shore Protection Project

In response to your letter of February 3, 1993, we would like the Corps to reconsider its position on the need for side-scan sonar for the nearshore area of the Martin County Shore Protection Project. We are encouraged that side-scan sonar will be used at the borrow area. However, this technology should also be applied to the beach restoration area. Our prior experience with the use of aerial photography to delineate hardbottom has been less than encouraging.

For projects on both the east and west coasts, our field biologists have identified significant and well colonized hardbottom features during site inspections which were not visible in aerial photographs. This has resulted in delays in the permitting process. For a project the size of that proposed in Martin County, such delays could be lengthy. We have not had this problem when hardbottom features have been mapped from side-scan sonar. In addition, we believe that side-scan sonar creates a product from which the acreage of individual hardbottom features can be more accurately measured than from aerial photographs. Finally, since side-scan sonar will be used to map hardbottom features at the borrow area, it would seem to incur minimal expense to conduct a survey of the beach area with equipment and a field crew which is already mobilized.

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Printed with Soy Based Inks

I would appreciate your serious consideration of our request and thank you for notifying us of your intentions. If you would like to discuss this issue further, please contact Marlene Stern at 904/488-0130.

Sincerely,

Janet G. Llewellyn

Janet G. Llewellyn, Chief
Bureau of Wetland Resource
Management

cc: Robert J. Brock, Corps of Engineers
Bonnie Dearborn, Martin County
Don Holloman, Martin County

Mid-Atlantic Technology
P. O. Box 4067
Wilmington, North Carolina 28406-1067
919 762-6215

2 March 1993

Janice Adams
Archaeologist
Planning Division/CESAJ-PD-ER
Jacksonville District Office
U. S. Army Corps of Engineers
P. O. Box 4970
Jacksonville, Florida 32232-0019

Re: Management Summary -- A Cultural Resources Magnetometer Survey for a Proposed Borrow Area Martin County, Florida. Contract # DACW17-93-M-0621.

Dear Ms Adams:

The field investigations portion of the above referenced project were completed on 27 February. Historical background investigations are 90% complete. Preliminary historical findings indicate that there are no recorded shipwrecks in the immediate project area.

A Geometrics 866 proton precession magnetometer was used to collect data for the field investigations. Twenty four survey lines were conducted over the 8,700-by-3500-foot portion of the survey area. Seven survey lines were conducted over the 4500-by-1000-foot portion of the proposed borrow area. Parallel survey lines were run north/south and were spaced 45 meters apart. Magnetic data was collected every two seconds or approximately every 7 meters along the survey lines. Positioning and track line maintenance were carried out with the aid of a Motorola Mini-Ranger III microwave positioning system interfaced with an onboard computer navigation system. The onboard navigation system, consisted of a 386 computer equipped with a math co-processor and data interface board. Kent Navigation System software was used to constantly record

vessel position, maintain survey lines, and log incoming magnetometer data. The Kent Navigation Program updates and logs the vessel's position every second and logs magnetometer data every two seconds.

Field analysis of magnetic data indicates that there are no magnetic anomalies in the project area. Based on this preliminary analysis, no mitigative actions or further investigations will be recommended in the draft report.

Sincerely yours,

Wes Hall
Mid-Atlantic Technology

469

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February 23, 1993

Programs and Project Management Division
Project Management Branch

Mr. Don Holloman, County Engineer
County Administrative Center
2401 S.E. Monterey Road
Stuart, Florida 34996

Dear Mr. Holloman:

This is a follow-up to your January 28, 1993, letter in which you had indicated that Applied Technology and Management, Inc. (ATM), would be obtaining the necessary construction permits. The enclosed items are provided to assist you and ATM in obtaining the necessary permits for construction of the Martin County Shore Protection Project. The descriptions of these items are as follows:

a. Aerial photographs of the project area are provided on mylar; a total of 21 mylar sheets. These aerial photographs were taken May 10, 1992. The scale is 1 inch = 100 feet.

b. Overlays for the aerial photographs are provided in ASCII format on diskette; a total of five 3-1/2 inch diskettes. These overlays provide a coordinate grid at 1 inch = 100 feet that is to be superimposed onto the mylars. The overlays were converted to an ASCII format so that they could be used on the CADD system. The Jacksonville District is equipped with Intergraph.

The District is aware of the Martin County Board of County Commissioners' desire to expedite construction of the shore protection project from a Fiscal Year (FY) 1996 to a FY 95 (November 1994) construction start. In order to meet the accelerated schedule, close coordination between Martin County, ATM, and the Jacksonville District will be needed in obtaining the construction permits. This close coordination is necessary to insure that material submitted in obtaining the permits is consistent with the information in the District's General Design

Memorandum (GDM). This coordination will also assist the District in addressing all of Martin County's needs in the GDM.

Should you have any questions, please contact the project manager, Mr. Rick McMillen, at 904-232-1231.

Sincerely,

SIGNED: Richard E. Bonner

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

Enclosures

Copies Furnished: (w/o encls)

Ms. Bonnie Dearborn, County Administrative Center, 2401 S.E. Monterey Road, Stuart, Florida, 34996
Ms. Karen Erickson, P.E., Applied Technology and Management Inc., 502 N.W. 75 Street, Suite 95, Gainesville, Florida 32607

bcf: (w/o encls)
CESAJ-PD
CESAJ-EN

RM 2/23/93
RMcMillen/CESAJ-DP-I
ts/3208 2/17
DD ~~DDuke~~/CESAJ-DP-A
RBonner/CESAJ-DP

LAWTON CHILES
GOVERNOR

STATE OF FLORIDA
Office of the Governor
THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0001

February 2, 1993

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

RE: Preparation of a General Design Memorandum (GDM) for Construction of a 4-Mile Section of Hutchinson Island - Martin County Shore Protection Project - Martin County, Florida

SAI: FL9212111882C

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 83-150, the Coastal Zone Management Act Reauthorization Amendments of 1990 and the National Environmental Policy Act, has coordinated a review of the above referenced project.

Pursuant to Presidential Executive Order 12372, the project will be in accord with State plans, programs, procedures and objectives when consideration is given to and action taken on the enclosed comments and requirements of our reviewing agencies.

The Department of Environmental Regulation (DER) requests that the following issues and concerns be fully addressed in the Environmental Assessment (EA): the EA should be based upon recent data; address the effects of an increase in the rate of erosion due to rising sea levels; address where the deposition of eroded beach fill is expected to occur and discuss the effects on benthic communities; provide a discussion on the environmental control measures that will be used to alleviate increased turbidity levels during the dredging process; and fully examine a comparative analysis of grain sizes from proposed borrow sites in order to select the site expected to generate the least amount of turbidity during the dredging process. The DER indicates that

the EA should include a federal consistency determination as required by the Coastal one Management Act and 15 CFR 930, Subpart C, and be submitted to the State for review. Please refer to the enclosed DER comments.

Please refer to the enclosed comments provided by the Department of State indicating that, prior to initiating any project related bottom disturbing activities within the borrow areas, they should be subjected to a professional magnetometer survey to locate and assess potential historic shipwreck sites. The DOS requests review of the resultant survey report in order to complete the process of reviewing the impact of this proposed project on historic resources.

The Department of Natural Resources (DNR) provides a list of information required for a successful project review including: side scan sonar survey of borrow, fill, and areas adjacent to the project site, south to Bathtub Reef; results of the geotechnical surveys as early as possible; analysis of the dispersion of silts from the fill material, in both onshore-offshore and longshore directions, with particular concern for long term effects on the worm rock reefs of Bathtub Reef; complete characterization of the nearshore habitat within the project area, including benthic and fisheries communities; and complete characterization of the coastal strand vegetation potentially affected by the construction of the design berm crest and its tie back to existing grade. The DNR maintains an interest in recreational resources in the project area, and any measures that may be taken to lessen project impacts. The DNR also expresses interest in proposals to mitigate unavoidable impacts to hardbottom, fisheries and other coastal resources of the project area. Please refer to the enclosed DNR comments.

The Department of Transportation (DOT) indicates that there are three DOT projects in the Adopted and Tentative Work Programs which may be affected by the proposed project. The DOT recommends early coordination with District 4 DOT staff to determine potential conflicts between the activities of the Department and the Corps, or interruption of normal traffic on State Road A1A, and to coordinate activities, maintenance of traffic, and determine any remedial actions necessary. Please refer to the enclosed DOT comments.

The federal agency did not provide a federal consistency determination for this project in accordance with 15 CFR 930, subpart C. However, the State has completed a review of the project information available at this time. Based on this information, the project at this stage is consistent with the Florida Coastal Management Program. Although the State does not

object to the proposed work, we have identified several issues which must be resolved as the project progresses through later stages of planning, design and funding. As required by 15 CFR 930.34 and .37, at each major point of decision-making the federal agency is required to submit a consistency determination for the State's review. The format and content of the determination are described in 15 CFR 930.34 - .39. The State's continued agreement with this project will be based, in part, on adequate reconciliation of previously identified concerns.

This letter reflects your compliance with Presidential Executive Order 12372.

Sincerely,

Janice L. Alcott

Janice L. Alcott, Director
State Clearinghouse

JLA/bl

Enclosure(s)

cc: Department of Environmental Regulation
Department of State
Department of Natural Resources
Department of Transportation

VICE CHAIRMAN
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CHAIRMAN
JEFF KRAUSKOPF
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District 3

MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN STATE OF FLORIDA

January 28, 1993
ADM-IG-93-71L

Richard E. Bonner, P.E.
Deputy District Engineer for
United States Army Corp of Engineers
Department of the Army
P.O Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Bonner:

We have contracted with Applied Technology and Management, Inc. to coordinate closely with the USACE and the appropriate State agencies in preparing the necessary permitting for construction of the Martin County Shore Protection Project.

As you know this project is a top priority of the Martin County Board of County Commissioners and having Applied Technology coordinate the permitting, we believe will help the USACE and Martin County in meeting the accelerated schedule of a November 1994 construction time frame.

Yours truly,

Don Holloman
County Engineer

DH:BBD

cc: Martin County Board of County Commissioners
Sue Whittle, County Administrator
Karen Erickson, Applied Technology and Management, Inc.

475

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VICE CHAIRMAN
MARSHAL L. WILCOX
District 1

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BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

COUNTY OF MARTIN STATE OF FLORIDA

January 28, 1993
ADM-IG-93-66L
COM-93CHR-014

Colonel Terrance C. Salt, District Engineer
United States Army Corp of Engineers
Department of the Army
P.O Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Salt:

The Martin County Shore Protection Project is a top priority of the Martin County Board of County Commissioners. Completion of the project is crucial to the public safety of the citizens of Hutchinson Island. We have requested the project to be expedited by a year, that is, construction start for November 1994 rather than 1995.

To assist in funding the accelerated schedule, Martin County is requesting the 1993 Florida Legislature to appropriate $470,259 for the planning, engineering, and design (PED) portion of the project. Martin County requests the USACE to accept the advanced funds ($470,259) from Martin County as its local share in order for the USACE to complete the PED phase for this project and to meet the expedited schedule.

The total project benefits are joint benefits of storm damage prevention, economic, and recreational benefits. Based on the severity of the erosion and the potential dangers to property owners, it is clear that the storm damage prevention benefits far outweigh the recreation benefits of the total project benefits. A recent profile by the USACE resulted in a recommendation that an additional 300,000 cubic yards is needed to renourish the beach due to the average 62,000 cubic yard erosion loss that has taken place in the last three years. The recommendation clearly demonstrates the need to accelerate the program. In addition, the project also has a benefit to cost ratio of 1.9.

We realize acceptance of advanced funds must first be coordinated by the HGUSACE with the ASA (CW) and approved by the Appropriations Committees of the Congress. We are working closely with our Congressional Delegation on this project, who fully support the need to expedite the Hutchinson Island beach nourishment project. Attached is a copy of Resolution No. 92-11.11c unanimously passed by the Martin County Board of Commissioners urgently requesting the USACE to expedite the project to a November 1994 construction timeline. We appreciate your continued interest in the project.

Yours truly,

Jeff Krauskopf
Chairman

cc: Members of our Congressional Delegation
Martin County Legislative Delegation
Sue Whittle, County Administrator
Kay Curiel, President, FS&BPA

BEFORE THE BOARD OF COUNTY COMMISSIONERS
MARTIN COUNTY, FLORIDA

RESOLUTION NO. 92-11.11c

HUTCHINSON ISLAND BEACH NOURISHMENT PROJECT

WHEREAS, the shoreline of Hutchinson Island, Martin County Florida has experienced acute beach erosion from the St. Lucie County line and extending south for four miles into Martin County over the last several years due to severe weather conditions, and placing many properties of beach front property owners in serious jeopardy, and

WHEREAS, a stabilized dune system along the shoreline would provide the badly needed protection for the beach front property owners that would be established by the nourishment of the beach from the St.Lucie County line four miles south into Martin County, and

WHEREAS, the residents of Martin County and the Board of County Commissioners are in unanimous agreement to expedite the project as early as possible in order to prevent further shoreline erosion of the beach front properties, and

WHEREAS, the Martin County Board of County Commissioners and the residents of Martin County have pledged support for the beach nourishment project by agreeing to provide the necessary local share through ad valorem taxes and special assessments, and

WHEREAS, continued erosion will only increase the costs of the project for the taxpayers, local, state and federal governments as well as cause increased anguish and despair to the shoreline property owners,

NOW, THEREFORE, BE IT RESOLVED that the Martin County Board of County Commissioners urgently requests the Army Corps of Engineers do everything they can to expedite the project by completing the PED portion of the project in time to accommodate a new construction start in FY 1995, and by working closely with the Florida Congressional Delegation, other Congressional Members, as well as all the state and federal agencies necessary to get the Hutchinson Island 4-mile beach nourishment project ready for construction in FY 1995.

DULY PASSED AND ADOPTED this 3rd day of November, 1992.

ATTEST;

MARSHA STILLER, CLERK

BOARD OF COUNTY COMMISSIONERS
MARTIN COUNTY, FLORIDA

MARY DAWSON, CHAIRMAN

APPROVED AS TO FORM AND
CORRECTNESS;

NOREEN S. DREYER
COUNTY ATTORNEY

ADM-IC-93-034M

Virginia B. Wetherell
Executive Director

FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Lawton Chiles
Governor
Jim Smith
Secretary of State
Bob Butterworth
Attorney General
Gerald Lewis
State Comptroller
Tom Gallagher
State Treasurer
Bob Crawford
Commissioner of Agriculture
Betty Castor
Commissioner of Education

January 11, 1993

RECEIVED
JAN 15 1993
STATE CLEARINGHOUSE

Ms. Janice Alcott
State Clearinghouse
Office of Planning and Budget
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: Martin County 4-Mile Shore Protection Project, Environmental Assessment Scoping Request

SAI: FL9212111882C

Dear Ms. Alcott:

The Department of Natural Resources has completed its review of the above referenced document, and submits comments as requested. As the request is for the scoping of issues to be addressed in the preparation of an environmental study and General Design Memorandum for the above beach nourishment project, the document has not been reviewed for federal consistency under the provisions of the Florida Coastal Management Program.

On January 11, 1992, staff of this agency representing the Executive Office and the Divisions of Beach and Shores, Marine Resources, and State Lands, met with DER, the Corps and Martin County to discuss information required for a successful project review. Required information includes, but is not limited to:

1. Side scan sonar survey of borrow, fill, and areas adjacent to the project site, south to Bathtub Reef.

2. Results of the geotechnical surveys as early as possible.

3. An analysis of the dispersion of silts from the fill material, in both onshore-offshore and longshore directions, with particular concern for long term effects on the worm rock reefs of Bathtub Reef.

4. A complete characterization of the nearshore habitat within the project area, including benthic and fisheries communities.

5. A complete characterization of the coastal strand vegetation potentially affected by the construction of the design berm crest and its tie back to existing grade.

Letter to Alcott
SAI FL9212111882C
January 11, 1993
Page 2

The Department's submerged lands and coastal construction project review processes will detail additional information requirements through the application processes.

In addition to the physical and biological information listed above, to complete project review, the Department also maintains an interest for recreational resources in the project area, and any measures that may be taken to lessen project impacts. Among these general concerns are a desire to remove from the beach structures that do not now or when filled will not serve a valid public purpose. The Department is also interested in proposals on how the applicant intends to mitigate unavoidable impacts to hardbottom, fisheries and other coastal resources of the project area.

For questions or information regarding the Department's review of the scoping request for Martin County 4-Mile Shore Protection Project please contact me at 904/488-1555. Thank you for consideration of these comments and questions.

Sincerely,

John F. Wettstein
Senior Management Analyst

cc: Mike Ashey, BSLAP MS125
Ed Conklin, DMR MS200
Karyn Erickson, Applied Technology and Mgt.
Rick McMillan, CESAJ-PD
Neal Rogers, BCER MS310
Marlene Stern, DER-BWRM
Frank Votra, OES MS150

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Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

8 January 1993

RECEIVED

JAN 12 1993

STATE CLEARINGHOUSE

Janice L. Alcott
Director, State Clearinghouse
Office of Planning and Budgeting
Budget Management and Planning Policy Unit
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: COE, Preparation of the General Design Memorandum (GDM) and Environmental Assessment (EA) for the Hutchinson Island Shore Protection Project, Martin County
SAI: FL9212111882C

Dear Ms. Alcott,

The U.S. Army Corps of Engineers (COE) is gathering information concerning beach renourishment along 4 miles of Hutchinson Island in Martin county. The information collected will be used in the preparation of an Environmental Assessment (EA) for the project.

We request that the following issues and concerns be fully addressed in the EA:

1. The EA should be based upon recent data. Information from the 1985 and 1986 Feasibility Report/Environmental Impact Statement for the Martin County Beach Erosion Control Study may be out-of-date due to the dynamic nature of beach and coastal systems.

2. The EA should address the effects of an increase in the rate of erosion due to rising sea levels. If a constant erosion rate which does not account for sea level rise is used in extrapolating the expected loss of beach fill, the resulting derived value may underestimate the amount of fill needed for periodic renourishment. Moreover, a conservative estimate will also bias the benefit/cost ratio.

Recycled Paper

3. The renourished beach will continue to be eroded over time, necessitating continued beach filling efforts. The EA should fully address where the deposition of eroded beach fill is expected to occur and discuss the effects on benthic communities. Bathtub Beach Reef, a unique ecological resource just south of the project area, should be specifically addressed in regard to detrimental effects that may occur from increased sedimentation in the water column and from drifting sand. Bottom communities in and adjacent to borrow sites should be included in the discussion on impacts to resources.

4. In regard to water quality, the EA should provide a discussion on the environmental control measures that will be used to alleviate increased turbidity levels during the dredging process. Moreover, a monitoring plan for the entire process should be included that is designed to check any violation of water quality standards according to Chapter 17-3, Florida Statutes.

5. A comparative analysis of grain sizes from proposed borrow sites should be fully examined in order to select the site expected to generate the least amount of turbidity during the dredging process.

Finally, the EA should include a federal consistency determination as required by the Coastal Zone Management Act and 15 CFR 930, Subpart C, and be submitted to the State for review. A reevaluation of the consistency of the project will be conducted during subsequent environmental documentation, design and permitting stages.

If you should have any questions regarding our comments, please call me at 488-0784.

Sincerely,

Susan Goggin

Susan Goggin
Environmental Specialist
Office of Intergovernmental Programs

SEG/s

cc: Marlene Stern, DER/Wetlands Resource Regulation
John Meyer, DER Southeast District

481

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FLORIDA DEPARTMENT OF TRANSPORTATION

LAWTON CHILES
GOVERNOR

BEN G. WATTS
SECRETARY

PALM BEACH URBAN OFFICE
3111 SOUTH DIXIE HIGHWAY, SUITE 112, WEST PALM BEACH, FLORIDA 33405
(407) 837-5290

OFFICE OF
PLANNING

December 29, 1992

RECEIVED
JAN 4 1993
STATE CLEARINGHOUSE

Ms. Janice Alcott
State Clearinghouse
Executive Office of the Governor
OPB-IGA
Room 411, Carlton Building
Tallahassee, Florida 32399-0001

Dear Ms. Alcott:

SUBJECT: Intergovernmental Coordination
SAI No. FL 9212111882C
Martin County Shore Protection

There are three (3) Florida Department of Transportation projects in the Adopted and Tentative Work Programs which may be affected by the proposed project. The listed projects are bridge rehabilitation projects (WPI No. 4116236 and 4116235) at the span over the ICWW and the Evans Crary Bridge scheduled for FY 1993/94 in the Tentative Work Program; and, replacement of the Evans Crary Bascule Bridge with a fixed span (WPI No. 4116291) scheduled for design in FY 1993/94 and R/W Acquisition in FY 1996/97 in the Tentative Work Program.

The Corps of Engineers has provided no description of the proposed beach nourishment operations or the dates of construction, so potential conflict cannot be determined at this time.

It is recommended that at the earliest time, at least prior to programming construction of the improvements, the Corps of Engineers meet with District 4, FDOT staff (Bill Keating, Consultant Management) to determine potential conflict between the activities of the Department and the Corps, or interruption of normal traffic on SR A1A, and to coordinate activities, maintenance of traffic, and determine any remedial actions necessary.

Please contact Bill Keating of Consultant Management at FDOT, District 4 (305-524-8621), if there are any questions.

Ms. Janice Alcott
December 29, 1992
Page two

The proposed project will not negatively impact the coastal barrier island.

Sincerely,

John W. Anderson/mg

John W. Anderson, AICP
Administrator, Palm Beach
Urban Office

JWA:mg

cc: Bill Keating
Gus Schmidt
Jamie Cochran
Clara Scott
Franklin Tse

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

December 28, 1992

REPLY TO
ATTENTION OF

Programs and Project Management Division
Project Management Branch

Honorable Connie Mack
United States Senator
1342 Colonial Boulevard, Suite 27
Fort Myers, Florida 33907

Dear Senator Mack:

This is in response to your December 16, 1992, letter regarding the beach erosion problem on Hutchinson Island, as expressed in Ms. Roslyn Langley's letter. We are well aware of the erosion problem that the Martin County beaches on Hutchinson Island are currently experiencing. We also understand Ms. Langley's concern in expediting construction of the Martin County Shore Protection Project.

As you know, a shore protection project was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990. Preconstruction, engineering and design (PED) is underway; and a General Design Memorandum (GDM) is 1 year away from completion. Once the GDM is completed, it will go through a review and approval process that typically takes 6 months. We expect to have the GDM approved June 1994. Plans and specifications, which are needed in order to award a construction contract, are scheduled for completion in fiscal year 1995. Under current policy, the GDM for the Martin County project has to be approved by June 1994 in order to be considered for fiscal year 1996 construction start. In order to be eligible for consideration as a fiscal year 1995 construction start, the GDM would have to be approved by June 1993. Unfortunately, the amount of time needed for GDM preparation, coordination, and review prevent us from meeting the June 1993 date.

We are aware of Martin County's efforts to expedite construction of this project. They have met with Congressman Lewis' staff regarding expediting construction of the project. Congressman Lewis has expressed a willingness to assist expediting construction of this project in any way possible.

We are currently maintaining close coordination with Martin County and are proceeding towards construction of the project as expediently as we can within our scheduling and funding limitations.

I hope this information is sufficient for your needs. If any additional information or assistance is needed, please call me or Mr. Richard Bonner, Deputy District Engineer for Project Management, at 904-232-2586.

Sincerely,

Terrence C. Salt
Colonel, U.S. Army
District Engineer

Copies Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Ms. Roslyn Langley, 1357 NE Ocean Boulevard, Apt 308, Stuart, Florida 34996

file

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

December 28, 1992

REPLY TO
ATTENTION OF

Programs and Project Management Division
Project Management Branch

Honorable Connie Mack
United States Senator
1342 Colonial Boulevard, Suite 27
Fort Myers, Florida 33907

Dear Senator Mack:

This is in response to your December 8, 1992, letter regarding the beach erosion problem on Hutchinson Island, as expressed in Ms. Caroline S. Haas' letter. We are well aware of the erosion problem that the Martin County beaches on Hutchinson Island are currently experiencing. We also understand Ms. Haas' concern in expediting construction of the Martin County Shore Protection Project.

As you know, a shore protection project was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990. Preconstruction, engineering and design (PED) is underway; and a General Design Memorandum (GDM) is 1 year away from completion. Once the GDM is completed, it will go through a review and approval process that typically takes 6 months. We expect to have the GDM approved June 1994. Plans and specifications, which are needed in order to award a construction contract, are scheduled for completion in fiscal year 1995. Under current policy, the GDM for the Martin County project has to be approved by June 1994 in order to be considered for fiscal year 1996 construction start. In order to be eligible for consideration as a fiscal year 1995 construction start, the GDM would have to be approved by June 1993. Unfortunately, the amount of time needed for GDM preparation, coordination, and review prevent us from meeting the June 1993 date.

We are aware of Martin County's efforts to expedite construction of this project. They have met with Congressman Lewis' staff regarding expediting construction of the project. Congressman Lewis has expressed a willingness to assist expediting construction of this project in any way possible. We

are currently maintaining close coordination with Martin County and are proceeding towards construction of the project as expediently as we can within our scheduling and funding limitations.

I hope this information is sufficient for your needs. If any additional information or assistance is needed, please call me or Mr. Richard Bonner, Deputy District Engineer for Project Management, at 904-232-2586.

Sincerely,

Terrence C. Salt
Colonel, U.S. Army
District Engineer

Copies Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Ms. Caroline S. Haas, 1357 NE Ocean Boulevard, Suntide Apt 211, Stuart, Florida 34996

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

December 28, 1992

REPLY TO
ATTENTION OF

Programs and Project Management Division
Project Management Branch

Honorable Connie Mack
United States Senator
1342 Colonial Boulevard, Suite 27
Fort Myers, Florida 33907

Dear Senator Mack:

This is in response to your December 8, 1992, letter regarding the beach erosion problem on Hutchinson Island, as expressed in Ms. Patricia McMaken Powell's letter. We are well aware of the erosion problem that the Martin County beaches on Hutchinson Island are currently experiencing. We also understand Ms. Powell's concern in expediting construction of the Martin County Shore Protection Project.

As you know, a shore protection project was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990. Preconstruction, engineering and design (PED) is underway; and a General Design Memorandum (GDM) is 1 year away from completion. Once the GDM is completed, it will go through a review and approval process that typically takes 6 months. We expect to have the GDM approved June 1994. Plans and specifications, which are needed in order to award a construction contract, are scheduled for completion in fiscal year 1995. Under current policy, the GDM for the Martin County project has to be approved by June 1994 in order to be considered for fiscal year 1996 construction start. In order to be eligible for consideration as a fiscal year 1995 construction start, the GDM would have to be approved by June 1993. Unfortunately, the amount of time needed for GDM preparation, coordination, and review prevent us from meeting the June 1993 date.

We are aware of Martin County's efforts to expedite construction of this project. They have met with Congressman Lewis' staff regarding expediting construction of the project. Congressman Lewis has expressed a willingness to assist expediting construction of this project in any way possible. We

are currently maintaining close coordination with Martin County and are proceeding towards construction of the project as expediently as we can within our scheduling and funding limitations.

I hope this information is sufficient for your needs. If any additional information or assistance is needed, please call me or Mr. Richard Bonner, Deputy District Engineer for Project Management, at 904-232-2586.

Sincerely,

Terrence C. Salt
Colonel, U.S. Army
District Engineer

Copies Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Ms. Patricia McMaken Powell, 1357 NE Ocean Boulevard, Apt 313, Stuart, Florida 34996

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

December 23, 1992

Programs and Project Management Division
Project Management Branch

Honorable Bob Graham
United States Senator
Post Office Box 3050
Tallahassee, Florida 32315

Dear Senator Graham:

This is in response to your November 25, 1992, letter regarding the beach erosion problem on Hutchinson Island, as expressed in Mr. James Barclay's letter. We are well aware of the erosion problem that the Martin County beaches on Hutchinson Island are currently experiencing. We also understand Mr. Barclay's concern in expediting construction of the Martin County Shore Protection Project.

As you know, a shore protection project was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990. Preconstruction, engineering, and design (PED) is underway; and a General Design Memorandum (GDM) is one year away from completion. Once the GDM is completed, it will go through a review and approval process that typically takes six months. We expect to have the GDM approved by June 1994. Plans and specifications, which are needed in order to award a construction contract, are scheduled for completion in Fiscal Year (FY) 1995. Under the current policy, the GDM for the Martin County project has to be approved by June 1994 in order to request funding from Congress for an FY 1996 construction start. An FY 1995 construction start would require the GDM to be approved by June 1993. The amount of time needed for GDM preparation, coordination, and review prevent us from meeting the June 1993 date. Completion of PED, as well as an FY 1996 construction start, is subject to the availability of funds.

We are well aware of Martin County's efforts to expedite construction of this project. Martin County intends to request Federal and non-Federal construction funds for FY 1995. Also, Martin County has met with Congressman Lewis' staff regarding expediting construction of the project. Congressman Lewis has expressed a willingness to assist expediting construction of this project in any way possible. We are currently maintaining close

coordination with Martin County and are proceeding towards construction of the project as expediently as we can within our scheduling and funding limitations.

I do hope this information provides a sufficient response to your letter. If any additional information or assistance is needed, please call Mr. Richard Bonner, the Deputy District Engineer for Project Management, at 904-232-2586.

Sincerely,

Hal K. Alguire
Major, U.S. Army
Deputy District Engineer

Copies Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Mr. James Barclay, 1357 NE Ocean Blvd, #310, Stuart, Florida 34996

491

484

Bob Graham
Florida

United States Senate
Washington, D.C.

Date 11/25/92

Colonel Terrence C. Salt
District Engineer
Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Enclosed is a letter from one of my constituents who has concerns which come under the jurisdiction of your agency.

I would appreciate your reviewing this situation and providing me with an appropriate response. Please direct your reply to:

Becky Liner
Office of Senator Bob Graham
Post Office Box 3050
Tallahassee, FL 32315

904/~~681-7726~~ 422-6100

Your cooperation and assistance are appreciated.

With kind regards,

Sincerely,

Bob Graham

United States Senator

Constituent's Name: James and Inger Barclay

Senator Bob Graham
44 West Flagler St.
Suite 1715
Miami, Fla., 33130

S. O. S.
We on Hutchinson Island request your help without delay to get desperately needed beach renourishment sooner rather than later. "Keep off the dunes" signs are in storage because along the shoreline in many places, there simply are no dunes. Eroded beaches add to threats to properties formerly built in accordance with acceptable environmental standards. Increasingly restrictive environmental regulations tie the hands of individual owners to protect their, in many cases, one and only, year-round residences. Only general beach renourishment will do.

Beach renourishment for Martin County's Hutchinson Island was scheduled for Fy 1993, but now has been postponed to Fy 1996, a delay that could endanger not only present properties at risk, but also the sandy beaches that have been attracting tourists to Stuart for years.

Our State and County are ready to expedite beach renourishment, but the Corps of Engineers has to allocate money for the project first. The State and County are ready to complete the funding of it. Will you, Sir, please enlighten the Corps about the urgency of our need and move the project up one or two years? Time is of the essence. All levels of government, federal, state, and county, must synchronize their efforts to save our beaches now.

Thank you in advance for your efforts on our behalf.

Sincerely,

Inger Barclay

Inger Barclay
Apartment 310
1357 North East Ocean Blvd.
Stuart, Florida
34996

SENATOR BOB GRAHAM

SOUTH FLORIDA OFFICE

SunTide 310
1357 N.E.Ocean Blvd.
Stuart, Fl. 34996
November 10,1992

Senator Bob Graham
44 West Flagler St.
Suite 1715
Miami. Fl. 33130

Today's newspaper headlines spotlight my area of concern.

The Palm Beach Post: "Wind, rain erode Treasure Coast Beaches."

The Stuart News: "Waves threaten beaches."

Both papers go on to cite the eroded shoreline, the toppled trees, the threatened homes, the closed beaches, as the latest evidence of what has developed into a serious situation on Hutchinson Island.

Where can you help?

Recommended relief - beach renourishment for the Martin County portion of Hutchinson Island - is losing ground. Originally targeted for FY 1993, it's now tentatively penciled in for FY 1996.

That's clearly too late. Come see the beaches. Talk with the owners. Each new storm adds to the list of threatened properties. Environmental restrictions limit individual owners to costly, inadequate, remedial measures. Only general beach renourishment offers real relief.

At a recent Martin County Commission meeting, I learned that the State and County are ready to go, but the process is a chain reaction:

1. The County doesn't allocate money until the State allocates money.
2. The State doesn't allocate money until the Corps of Engineers allocates money.
3. The Corps of Engineers balances need and pressure. We have the need. We lack the pressure. That's where you come in.

"If he pushes, we respond" said the Corps representative at the County Commission meeting.

Pressure from your office could move this project up one, perhaps even two years. But time is of the essence. Varying budget timetables for the Feds, the State, and the County must mesh to bring this about.

Please help!

Sincerely yours,

James C. Barclay

DEC 31 1992

STATE CLEARINGHOUSE

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State

DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

In Reply Refer To:
Susan Hammersten
Compliance Review
Section, DHR
(904) 487-2333

PFN: 923682

December 21, 1992

Ms. Janice L. Alcott, Director
State Clearinghouse-OPB
Executive Office of the Governor
Room 411, Carlton Building
Tallahassee, Florida 32399-0001

RE: SAI# FL9212111882C
Martin County Shore Protection Project, Hutchinson Island
Martin County, Florida

Dear Ms. Alcott:

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 above referenced project(s) for possible impact to historic properties listed, or eligible for listing, in the National Register of Historic Places.

It is the opinion of this office that the beach renourishment portion of the project will have no adverse effect on any properties listed or eligible for listing on the National Register. However, we feel that the borrow areas have the potential to contain significant historic shipwreck sites.

Since potentially significant historic sites may be present in the borrow areas, it is our determination that, prior to initiating any project related bottom disturbing activities within the borrow areas, they should be subjected to a professional magnetometer survey. The purpose of this survey will be to locate and assess potential historic shipwreck sites. This survey should be conducted under the direction of a professional underwater archaeologist. The resultant survey report must be forwarded to this agency in order to complete the process of reviewing the impact of this proposed project on historic resources.

Ms. Alcott
December 21, 1992
Page 2

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/Hsh

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

December 23, 1992

Programs and Project Management Division
Project Management Branch

Honorable Connie Mack
United States Senator
1342 Colonial Boulevard, Suite 27
Fort Myers, Florida 33907

Dear Senator Mack:

This is in response to your November 23, 1992, letter regarding the beach erosion problem on Hutchinson Island, as expressed in Ms. Katherine McCullough's and Mr. James Barclay's letters. We are well aware of the erosion problem that the Martin County beaches on Hutchinson Island are currently experiencing. We also understand Ms. McCullough and Mr. Barclay's concern in expediting construction of the Martin County shore protection project.

As you know, a shore protection project was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990. Preconstruction, engineering and design (PED) is underway; and a General Design Memorandum (GDM) is one year away from completion. Once the GDM is completed, it will go through a review and approval process that typically takes six months. We expect to have the GDM approved June 1994. Plans and specifications, which are needed in order to award a construction contract, are scheduled for completion in Fiscal Year (FY) 1995. Under the current policy, the GDM for the Martin County project has to be approved by June 1994 in order to request funding from Congress for an FY 1996 construction start. An FY 1995 construction start would require the GDM to be approved by June 1993. The amount of time needed for GDM preparation, coordination, and review prevent us from meeting the June 1993 date. Completion of PED, as well as an FY 1996 construction start, is subject to the availability of funds.

We are well aware of Martin County's efforts to expedite construction of this project. Martin County intends to request Federal and non-Federal construction funds for FY 1995. Also, Martin County has met with Congressman Lewis' staff regarding expediting construction of the project. Congressman Lewis has expressed a willingness to assist expediting construction of this

project in any way possible. We are currently maintaining close coordination with Martin County and are proceeding towards construction of the project as expediently as we can within our scheduling and funding limitations.

I do hope this information provides a sufficient response to your letter. If any additional information or assistance is needed, please call Mr. Richard Bonner, the Deputy District Engineer for Project Management, at 904-232-2586.

Sincerely,

Hal K. Alguire
Major, U.S. Army
Deputy District Engineer

Copies Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Mr. James Barclay, 1357 NE Ocean Blvd, #310, Stuart, Florida, 34996
Ms. Katherine McCullough, 1357 NE Ocean Blvd, #120, Stuart, Florida, 34996

CONNIE MACK
FLORIDA

United States Senate

WASHINGTON, DC 20510-0904

December 16, 1992

Col. Terrence C. Salt
Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Col. Salt:

Enclosed please find correspondence from Ms. Roslyn Langley.

I would appreciate your advising me of your action in this matter and returning the letter with your reply. Please respond to my Fort Myers Regional Office, located at 1342 Colonial Blvd, Suite 27, Fort Myers, Florida 33907, (813) 275-6252.

Thank you for your prompt attention.

Sincerely,

Connie Mack

Connie Mack
U.S. Senate

CM/alb
Enclosure

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492

DAO
RLM.

APPLIED TECHNOLOGY AND MANAGEMENT, INC.
502 N.W. 75 STREET, SUITE 95
GAINESVILLE, FLORIDA 32607
TELEPHONE: (904) 375-8700 • FAX (904) 375-0995

MEMORANDUM

TO: DER - Marlene Stern
Ken Echternacht
Micky Bryant

DNR - David Arnold - Marine Resources
Al Devereaux - DBS
Mike Ashley - DSL
Kirby Green - State Funding

COE - Rick McMillen

County - Don Holloman - County Engineer
Karyn Erickson - ATM

FROM: Karyn M. Erickson, P.E., Vice President KME/EXL
Applied Technology and Management, Inc.

DATE: December 14, 1992

RE: Martin County 4-Mile Beach Nourishment Project
Permit Pre-Application Meeting

Per our meeting of Monday, December 7, 1992, a permit pre-application meeting has been scheduled for January 11, 1993 at 10:00 am. The purpose of this meeting is to discuss the project's environmental information and potential project concerns with all regulatory agencies responsible for authorizing the construction permits.

The Corps is presently in the process of conducting baseline environmental and design studies for the PDE and GDM work and has agreed to work with the County to coordinate this effort with the initiation of the permit review process in order to satisfy concerns related to the project's environmental impacts and associated mitigation plans. The intent of the County is to accelerate the project design and permitting phases of the project in order to qualify for inclusion in the State's 1995 Fiscal Year Public Works Program Budget.

Rick McMillen, Project Manager for the USACOE, will coordinate with his project team to attend this meeting, as will Marlene Stern for FDER.

Please advise me as to whom will participate from your office at this meeting. Also, let me know if you would like a copy of the Project's Coastal Engineering and Environmental Studies Report, which summarizes the baseline environmental studies conducted by the County to evaluate the various concerns expressed by FDER and FDNR regulatory review staff based on the USACOE's feasibility report (1984) for this project.

KME/rkl

cc: Micky Bryant, DER
Rick McMillen, COE
Doug Rosen, COE
Robert Brock, COE
Cynthia Murphy, COE
Mike Sole, DNR
Bill Whitfield, DNR
David Arnold, DNR
Fritz Wettstein, DNR
Ken Echternacht, DER
Bonnie Dearborn, Martin County

APPLIED TECHNOLOGY AND MANAGEMENT, INC.
502 N.W. 75 STREET, SUITE 95
GAINESVILLE, FLORIDA 32607
TELEPHONE: (904) 375-8700 • FAX (904) 375-0995

MEMORANDUM

TO: Rick McMillen, Project Manager
Martin County 4-Mile Beach Nourishment Project
USACOE, Jacksonville District

FROM: Karyn Erickson, P.E., Vice President KME/RKL
Applied Technology and Management, Inc.

DATE: December 9, 1992

RE: Scheduling for Agency Permit Pre-application Meeting
Martin County 4-Mile Beach Nourishment Project

Per our meeting on Monday, December 7, 1992, I have spoken with the DER staff responsible for the review of the project permits regarding scheduling of the above described meeting. Marlene Stern called to say that both she and Ken Echternacht are available on January 11 or January 13, 1992, between 9 AM and Noon, to discuss the project's environmental information and potential project concerns.

Please coordinate with your project team concerning these alternate times to meet and respond via telephone or fax (904-375-0995) with respect to your availability on one or both dates. I would like your response by Friday afternoon (December 11th) in order to forward the meeting date to the other meeting participants.

Thank you for your help.

KME/rkl

Stuart, Florida
9 Decemver 1992

Senator Connie Mack
1342 Colonial Blvd.
Suite 27
Ft. Myers, Florida 33907

FORT MYERS
DEC 15 1992

Dear Senator Mack:

I reside at 1357 N. E. Ocean Blvd., Stuart, Florida 34996.

This letter is written to ask for your good graces in obtaining beach renourishment for Hutchinson Island in Martin County, Florida.

As I write this letter beach erosion has already placed several properties at serious risk on Hutchinson Island. Current schedule for renourishment will most likely be too late to prevent serious losses on Hutchinson Island.

Others, including the Corps of Engineers, have expressed a willingness to advance the renourishment project.

It is my understanding that the State and the County are ready to allocate matching funds if t e Fed will advance the renourishment date.

Time is of the essence to meet the budgeting deadlines for the various Federal, State and County Agencies.

We earnestly solicit your help in obtaining the necessary beach renourishment as soon as possible.

Respectfully,
Roslyn Langley
Roslyn Langley

Roslyn Langley
Apt 308
1357 N. E. Ocean Blvd.
Stuart, Florida 34996

503

496

CONNIE MACK
FLORIDA

United States Senate

WASHINGTON, DC 20510-0904

December 8, 1992

Col. Terrence C. Salt
Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Col. Salt:

Enclosed please find correspondence from Caroline S. Haas.

I would appreciate your advising me of your action in this matter and returning the letter with your reply. Please respond to my Fort Myers Regional Office, located at 1342 Colonial Blvd, Suite 27, Fort Myers, Florida 33907, (813) 275-6252.

Thank you for your prompt attention.

Sincerely,

Connie Mack

Connie Mack
U.S. Senate

CM/alb
Enclosure

JAX DISTRICT DEC 1 [illegible] 0700

November 25 1992

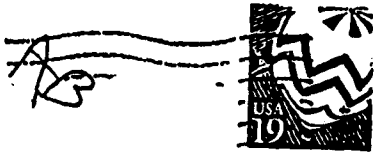
Gas • Restaurants • Lodging
I-95/Exit 145
Gold Rock, N.C.

Please

We desperately need beach renourishment Martin County Line to Bathtub Beach on Hutchinson Island. We are good taxpayers.

(Mrs.) Caroline S. Haas
Sunrise Apt 211
1357 N.E. Ocean Blvd
Stuart Fl. 34996

Thank you



post card

FORT MYERS

Rep. Connie Mack
1300 Colonial Blvd.
SUITE 27
Ft Myers-
Fl. 33907

505

498

CONNIE MACK
FLORIDA

United States Senate

WASHINGTON, DC 20510-0904

December 8, 1992

Col. Terrence C. Salt
Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Col. Salt:

Enclosed please find correspondence from Ms. Patricia McMaker Powell.

I would appreciate your advising me of your action in this matter and returning the letter with your reply. Please respond to my Fort Myers Regional Office, located at 1342 Colonial Blvd, Suite 27, Fort Myers, Florida 33907, (813) 275-6252.

Thank you for your prompt attention.

Sincerely,

Connie Mack

Connie Mack
U.S. Senate

CM/alb
Enclosure

JAX DISTRICT 1

Rich M.
copy provided
12/10/92

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

GROWTH MANAGEMENT DEPARTMENT
SUSAN F. ADAMS, Director
Phone (407) 288-5495 • Fax (407) 288-5432

December 7, 1992

Mr. Richard Bonner
US Army Corps of Engineers
400 West Bay Street
Jacksonville, FL 32232-0019

Re: Feasibility study of Martin County's Beach Nourishment Project.

Dear Mr. Bonner:

I would like to request a copy of the Corps of Engineers feasibility study of Martin County's Beach Nourishment project. After brief discussion with Mr. McMillen at the recent Beach Nourishment seminar in Stuart, he forwarded your name on to me in regard to acquiring this document.

I would like to review this information prior to the meeting in Tallahassee with the Dept. of Environmental Regulation, yourself and Martin County staff. This would allow me time to convey information regarding this project in the likely possibility of not being able to attend this meeting.

I appreciate your cooperation and courtesy with this request. Please feel free to contact me with any questions or comments regarding this information at (407) 288-5495. Thank You.

Sincerely Yours,

Mark M. Tamblyn
Environmental Analyst

507

500

CONNIE MACK
FLORIDA

United States Senate

WASHINGTON, DC 20510-0904

December 1, 1992

Col. Terrence C. Salt
Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Col. Salt:

Enclosed please find correspondence from Ms. Katherine McCullough.

I would appreciate your advising me of your action in this matter and returning the letter with your reply. Please respond to my Fort Myers Regional Office, located at 1342 Colonial Blvd, Suite 27, Fort Myers, Florida 33907, (813) 275-6252.

Thank you for your prompt attention.

Sincerely,

Connie Mack

Connie Mack
U.S. Senate

CM/alb
Enclosure

JAX DISTRICT DEC 3 '92 07

Katherine McCullough
1357 NE Ocean #120
Stuart, Fl. 34996

AB

Senator Connie Mack

FORT MYERS
NOV 27 1992

Dear Senator,

I am writing because of the imminent danger from the ocean to the condominiums on the Hutchinson Island, in Martin County. There are many condos in trouble, and also beach accesses, including Bathtub. If we have to wait until 1996 for a Beach Nourishment Program it may be too late.

I attended a Martin County Commissioners meeting recently. The Army Corps of Engineers, as I understood facts, have the funding to go with a Beach nourishment program from Bathtub Beach north

to the Martin County line, and if they receive a yes they will schedule in the time frame of the Fiscal Year Oct. 1993 with work to be accomplished in 1994.

I am asking you Senator Mack to please consider our need and order a go ahead for the Fiscal Year 93-94 time frame. Martin County Commissioners are also behind this earlier date, according to my interpretation.

I will look forward to a favorable reply from you.

Sincerely

Nathan McCullough

510

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FORT MYERS

DEC 01 1992

PATRICIA MC MAKEN POWELL
1357 N E OCEAN BLVD 313
STUART FL 34996

27 November 92

The Honorable Connie Mack
1342 Colonial Blvd. t
Suite 27
Ft. Myers FL 33907

Dear Senator Mack,

The beaches on Hutchinson Island (Martin County Florida) are in crisis!

As you undoubtedly know, the current schedule for beach renourishment is fiscal year 1996. That will be TOO LATE! Severe erosion along the coast has already occured; and the Corps of Engineers has expressed a willingness to move the project up in the schedule, provided our elected officials, such as you, indicate support for doing so.

The State and County are ready to allocate matching funds if the Federal "Powers that be" advance the renourishment date.

Time is of the essence! Please bear in mind that all beaches are PUBLIC BEACHES. As you know, there are no private beaches; and I am sure you are aware that our beaches attract many tourists and that tourism is a large factor in Florida's economy.

Thank you in advance for helping us.

Sincerely,

Patricia McMaken Powell
Property owner and VOTER

511

504

CONNIE MACK
FLORIDA

United States Senate

WASHINGTON, DC 20510-0904

November 23, 1992

Col. Terrence C. Salt
Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Col. Salt:

Enclosed please find correspondence from James C. Barclay.

I would appreciate your advising me of your action in this matter and returning the letter with your reply. Please respond to my Fort Myers Regional Office, located at 1342 Colonial Blvd, Suite 27, Fort Myers, Florida 33907, (813) 275-6252.

Thank you for your prompt attention.

Sincerely,

Connie Mack

Connie Mack
U.S. Senate

CM/alb
Enclosure

FORT MYERS
NOV 17 1992

AB

Senator Connie Mack
1342 Colonial Blvd.
Suite 27
Ft. Myers, Fla., 33907

S. O. S.

We on Hutchinson Island request your help without delay to get desperately needed beach renourishment sooner rather than later. "Keep off the dunes" signs are in storage because along the shoreline in many places, there simply are no dunes. Eroded beaches add to threats to properties formerly built in accordance with acceptable environmental standards. Increasingly restrictive environmental regulations tie the hands of individual owners to protect their, in many cases, one and only, year-round residences. Only general beach renourishment will do.

Beach renourishment for Martin County's Hutchinson Island was scheduled for Fy 1993, but now has been postponed to Fy 1996, a delay that could endanger not only present properties at risk, but also the sandy beaches that have been attracting tourists to Stuart for years.

Our State and County are ready to expedite beach renourishment, but the Corps of Engineers has to allocate money for the project first. The State and County are ready to complete the funding of it. Will you, Sir, please enlighten the Corps about the urgency of our need and move the project up one or two years? Time is of the essence. All levels of government, federal, state, and county, must synchronize their efforts to save our beaches now.

Thank you in advance for your efforts on our behalf.

Sincerely,

Inger Barclay

Inger Barclay
Apartment 310
1357 North East Ocean Blvd.
Stuart, Florida
34996

513

506

SunTide 310
1357 N.E.Ocean Blvd.
Stuart, Fl. 34996
November 10,1992

FORT MYERS
NOV 1 8 1992

Senator Connie Mack
1342 Colonial Blvd.
Suite 27
Ft. Myers, Fl. 33907

Today's newspaper headlines spotlight my area of concern.

The Palm Beach Post: "Wind, rain erode Treasure Coast Beaches."

The Stuart News: "Waves threaten beaches."

Both papers go on to cite the eroded shoreline, the toppled trees, the threatened homes, the closed beaches, as the latest evidence of what has developed into a serious situation on Hutchinson Island.

Where can you help?

Recommended relief - beach renourishment for the Martin County portion of Hutchinson Island - is losing ground. Originally targeted for FY 1993, it's now tentatively penciled in for FY 1996.

That's clearly too late. Come see the beaches. Talk with the owners. Each new storm adds to the list of threatened properties. Environmental restrictions limit individual owners to costly, inadequate, remedial measures. Only general beach renourishment offers real relief.

At a recent Martin County Commission meeting, I learned that the State and County are ready to go, but the process is a chain reaction:

1. The County doesn't allocate money until the State allocates money.
2. The State doesn't allocate money until the Corps of Engineers allocates money.
3. The Corps of Engineers balances need and pressure. We have the need. We lack the pressure. That's where you come in.

"If he pushes, we respond" said the Corps representative at the County Commission meeting.

Pressure from your office could move this project up one, perhaps even two years. But time is of the essence. Varying budget timetables for the Feds, the State, and the County must mesh to bring this about.

Please help!

Sincerely yours,

James C. Barclay

James C. Barclay

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C.S.
CS
RM
Rhm

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

October 22, 1992

Programs and Project Management Division
Project Management Branch

Honorable Connie Mack
United States Senate
Attn: Mr. Scott Barnhart
Washington, D.C. 20510

Dear Senator Mack:

I regret that it has taken longer than usual to respond to your September 17, 1992, letter regarding the shore protection project on Hutchinson Island in Martin County. Our staff has been assisting with recovery efforts associated with Hurricane Andrew since August.

Your concern in regard to expediting the project is understood. We are aware of the situation that Martin County beaches are currently experiencing. We have been working closely with the county to expedite this project. However, there are significant environmental concerns related to turtle nesting along the proposed project shoreline that must be addressed. At this time, we do not see how addressing the environmental concerns and coordinating the reports that must be prepared in order to obtain construction funding can be accomplished in a shorter time period. However, we will continue to explore ways with the county to accelerate the schedule where possible.

Our office will maintain close coordination with the county on the preparation of the necessary documents and proceed towards construction of the project as expediently as we can within our scheduling and funding capabilities.

515

508

I hope this information provides a sufficient response to your letter. If any additional information or assistance is needed, please call me or Mr. Richard Bonner, Deputy District Engineer for Project Management, at 904-232-2586.

Sincerely,

Terrence C. Salt
Colonel, U.S. Army
District Engineer

Copy Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Ms. Mary Dawson, Chairman, Martin County Board of County Commissioners, 2401 S.E. Monterey Road, Stuart, Florida 34996

FRANK A. WACHA
District 1

JEFF KRAUSKOPF
District 2

Vice Chairman
WALTER W. THOM, JR.
District 3

MAGGY HURCHALLA
District 4

Chairman
MARY E. DAWSON
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN STATE OF FLORIDA

October 22, 1992

ADM-IG-93-027L

Mr. Rick McMillian
Project Manager
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. McMillian:
I appreciate your response to my request to attend the Martin County Board of Commissioners meeting on Tuesday, November 3 to discuss the status of the 4-Mile Beach Nourishment project on Hutchinson Island. The board item for the project is preset for 1:30 p.m. for discussion. The meeting location is the Martin County Administration Building at 2401 S.E. Monterey Road, Stuart, Florida 34996.

The main purpose of the item is to discuss the status of the project, the local, state and federal funding and construction schedules. I am enclosing a copy of the board item and the backup for you to review prior to the meeting.

Again, we are very pleased that you will be able to attend to inform the Board of the status of the beach project at the state level.

Yours truly,

Bonnie B. Dearborn
Intergovernmental Relations

cc: Martin County Board of County Commissioners
Sue Whittle, County Administrator
Al Silverman, V.P. FS&BPA

BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY FORM

1. WORDING OF AGENDA

Beach Nourishment Project & Approval of Correspondence to Governor's Office

2. MEMO NUMBER: - ADM-IG-93-025M

3. MEETING DATE: November 3, 1992

REGULAR X SPECIAL ___

4. PREVIOUS AGENDA ITEM:
A. YES X B.NO___

Date and Agenda Number
10/20/92 7C2

5. AGENDA PLACEMENT:

___ CONSENT
___ PUBLIC HEARING
___ REQUEST/PRESENTATION
X DEPARTMENTAL
___ COMMISSIONERS
___ NOTED ITEM
___ OTHER

TIME REQUIRED:

6. REQUIREMENT/PURPOSE: (specify)

STATUTE _____
ORDINANCE _____
BCC REQUEST_____
OTHER _____
(explain) _____

7. REQUESTOR'S NAME:

A. (ALL REQUESTS)
NAME Bonnie Dearborn
DEPT. Administration

B. (PUBLIC ONLY)
CITIZEN NAME_____
CITIZEN PHONE_____

8. BACKGROUND:

Due to the continued erosion along the Hutchinson Island shoreline residents are becoming more and more concerned for their properties and are very anxious to have the beach project accelerated for construction in **1994**. At the present time, the project is scheduled for construction in ~~1996~~. This schedule has come about primarily as to, when Congress actually acc. appr. has approved appropriations for the project and the work schedules of the ACOE. Staff has been working with our Congressmen and the State to have the project accelerated by one year, that is **1995**, rather than 1996. To assist us in this effort Congressman Tom Lewis has agreed to request construction appropriations out of sequence of the 2 year budget cycle and DNR has included in their 1993-94 Fixed Capital outlay budget that preliminary construction and design (PED) portion of Martin County Beach Nourishment project **(State share $470,259)**. This is significant since Martin County's schedule for state appropriation request was not scheduled until **1994**. This clearly demonstrates the DNR's interest is assisting the County in getting its project moved forward. The PED appropriations must be approved by the 1993 Legislature.

Both the Army Corp of Engineers and the Florida Department of Natural Resources have been invited to come to the Board meeting of November 3 to give a status report of the project and to discuss the possibility of expediting the project to **1994**, rather than 1995 or its current schedule of 1996.

In addition, Al Silverman, Vice President of the Martin County Chapter of the Florida Shore and Beach Preservation Association has invited a number of people to attend/speak at the Commission meeting of November 3 in support accelerating the project to **1994**. **(Attachment A-1)**

Project Local Funding

The estimated $12,500,000 project will be funded from a number of sources as follows:

Federal and State funding will contribute approximately 85% of project costs. The Local Sponsor (Martin County) will contribute the remaining project costs.

Prior discussions concerning the Local Sponsor share have included contributions from:

* Island Residents

  a. Beach Front Assessments
  b. Other Resident Contributions (Hutchinson Island MSTU)

* County-wide Contributions

  a. Ad Valorem Taxes
  b. Other County-wide Special Assessments
  c. Impact/User Fees

Any "Assessments" will require preparation of an Ordinance to amend current County Codes allowing these types of assessments. It will also require decisions as to the type of assessments, e.g., front-foot, property value, or a combination thereof.

Project Federal/State Funding

For additional information there is included a copy of a memorandum providing a chronology of past events that staff has undertaken with Commission approval to expedite the proposed nourishment project on Hutchinson Island. **(Attachment A-2)** Subsequent activity is provided below.

In May 1992, staff met with DNR staff in Tallahassee to request their help in expediting our beach nourishment project. Their support would assist us in generating more federal support.

In July 1992, Bonnie Dearborn of Intergovernmental Relations met with Congressman Tom Lewis and both Senators Graham and Mack in Washington to request their help to expedite our beach nourishment project because of the accelerated erosion that has taken place over the past few years due to severe storm activity. (Follow-up correspondence to and from our Congressmen are attached). **(Attachments B,C,D,E)**

In September 1992, staff met with Karen Hogan, Congressman Tom Lewis' Aide, when she was in the District and again requested their help. Ms. Hogan already aware of the meeting with Congressman Lewis said it was a top priority of Congressman Lewis to work with the USACOE to get the project expedited by one year, that is, construction in 1995 rather than 1996.

September 1992 DNR informed Martin County that a request for (75%) or $470,259 has been included in DNR's fixed capital budget for FY 93-94, which was approved by the Governor and Cabinet. The local share is (25%) or $156,752. **(Attachment F)**

On October 2, 1992, the President signed the appropriations bill which included Martin County's appropriation request of [illegible]00,000 for the second half of the pre-construction and design portion of the beach project. This completes the Federal funding request of $650,000 for pre-construction and design work. The first $350,000 was already appropriated by Congress last year.

On October 26, 1992, there will be a public hearing on the Governor's budget. A copy of a letter to the Governor's office from the Chairman of the Martin County Board of County Commissioners is attached **(Attachment G)** requesting the Governor to approve FDNR's fixed capital outlay budget request including Martin County's project funds. Also are copies of letters to members of Martin County's Legislative Delegation requesting them to contact the Governor's office on behalf of Martin County. **(Attachments H,I)** The Governor's budget will be presented to the Legislature in December.

Also included is a copy of a letter from USACOE informing the County construction would be delayed until 1996. **(Attachment J-1)**

In addition, there is a letter from the Chairman to USACOE informing them of our Congressmen's willingness to assist in getting our project accelerated by one year and requesting USACOE to coordinate a meeting with FDNR, FDER, USACOE and Federal environmental agencies to discuss environmental issues. **(Attachment J-2)**

9. RECOMMENDED ACTION:
Direct Staff to expedite the process to establish a special assessment district for beachfront property owners within the project.

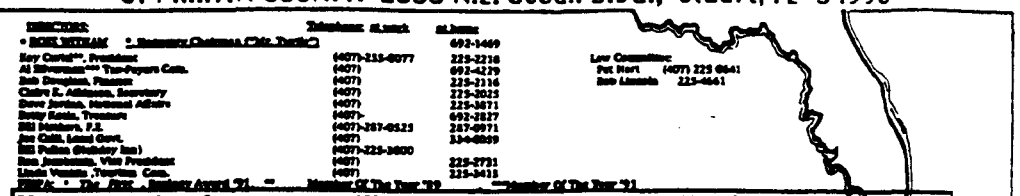
10. RECOMMENDED APPROVAL:

DEPARTMENT DIRECTOR	PS	I/S	B&Z	GMD	PW	ENG	UT	BUDG	PUR	COUNTY ADMIN.	COUNTY ATTY.
						X				X	

ATTACHMENT A-1

FLORIDA SHORE & BEACH PRESERVATION ASSOCIATION INC.

of MARTIN COUNTY: 2355 N.E. Ocean Blvd., Stuart, FL 34996



Your sustained support will save Martin County PUBLIC BEACHES

MOST URGENT Beach Allert

The Martin Commission Meeting

Tuesday November 3rd 1992

Preset at 1:30 PM

At The MArtin County Commission Chambers
Administrative Center
2401 SE Monerray Rd
Stuart, Florida

CRISIS ON THE BEACH !!!!!

INVITED SPEAKERS

Robert Dean, Dean of Oceanoghy, University of Floirda

Karen Erickson, P.E., Applied Technology & Management
Daryl Hathaway

Thomas Campbell, P.E., Coastal Planning & Engineering

Michael Walters, P.E., Coastal Tech

Ross Witham, Research Scientist, U. of Miami

Robert Snyder, P.E., Snyder Oceangraphic Services

521

514

FRANK A. GACHA · JEFF KRAUSKOPF · WALTER W. THOM, JR. · MAGGY HURCHALLA · MARY E. DAWSON

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN · STATE OF FLORIDA

August 17, 1992

IGG-92-201L

The Honorable Tom Lewis
The U.S. House of Representatives
Room 2351 Rayburn HOB
Washington D.C. 20515

ATTACHMENT B

Dear Congressman Lewis:

First, I want to let you know how much we appreciate the strong support and assistance you have already given to Martin County's 4-mile beach nourishment project on Hutchinson Island, Martin County, Florida. I also want to thank you for taking the time to meet with me on such short notice while I was vacationing in Washington D.C. on Friday, July 31. We are very grateful for your interest and willingness to help us expedite the construction of the beach nourishment project by one year, i.e, begin construction in 1995 rather than 1996 as is currently scheduled by the Army Corps of Engineers (ACOE).

I have been informed that the ACOE has recently completed a beach profile of the project area and comparing it to the 1989 beach profile study the ACOE is now recommending that an additional 300,000 cubic yards is needed due to the average 62,000 cubic yard erosion loss that has taken place in the last three years. This additional information clearly demonstrates the beach is eroding at a faster rate than was anticipated and the need to accelerate the project becomes more crucial.

In our discussion in Washington, I told you that Martin County had received correspondence in March from Richard E. Bonner, Deputy District Engineer for Project Management of the ACOE informing us that, although the current schedule for completion of the preconstruction phase of the beach nourishment project will be completed by September 1995, that due to the 2-year budget cycle the expenditure of construction funds will not be available until FY 96. I also told you of the concerns the County has for the residents of that area whose residences are in jeopardy due to the acute beach erosion that has occurred along Hutchinson Island hence, the need to expedite the project. This situation was brought on by the severe storm conditions that took place last fall/winter. Condominiums that are now in jeopardy have required additional coastal armoring for their protection, a practice we reluctantly support due to the adverse affects the armoring has on turtle nesting and

Similar letters
Also sent to
Senators
Graham & Mack
RF

destruction of the recreational beach. In some cases, however, residents have lost their pools from their yards and their property is in serious danger.

I also related to you, that at our request the ACOE did investigate two roadway sites on Hutchinson Island just south of the project site that had experienced severe erosion from storm activity, to determine their eligibility for ACOE funding to do corrective work. Although these two sites are not located within the immediate project area, the beach nourishment project would provide added protection to these road sites since the dunes that ultimately protect the road sites would be enhanced by the downdrift movement of sand as it moves southward along the shoreline. Due to other factors, however, the ACOE concluded the sites were not eligible for funding.

We realize the time schedules for these projects are dictated by the appropriations and legislative process as well as the implementation of the various phases. We are very concerned, however, that continued erosion of the beaches will cause undue hardship to those residents whose properties are being severely threatened.

We need your help in expediting the project hopefully by one year. I have enclosed copies of correspondence to and from the ACOE that I told you I would send to you which may help you and your staff in working with the ACOE in accelerating the project. I believe you said Karen Hogan of your staff is handling this assignment. This mission is very important to the residents of Martin County. We know, however, that we cannot succeed in getting the project moved ahead without your strong support. If there is anything else we can do to assist you in this matter, please do not hesitate to contact my office at (407) 221-1357.

Yours truly,

Bonnie B. Dearborn
Intergovernmental Relations

cc: Honorable Members of the Martin County Board of Commissioners
Sue Whittle, County Administrator
Robert Denison, Director of Parks & Recreation

523

516

FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Virginia B. Wetherell
Executive Director

Lawton Chiles
Governor
Jim Smith
Secretary of State
Bob Butterworth
Attorney General
Gerald Lewis
State Comptroller
Tom Gallagher
State Treasurer
Bob Crawford
Commissioner of Agriculture
Betty Castor
Commissioner of Education

RECEIVED
OCT 0 1992

September 24, 1992

ATTACHMENT F

Mr. Richard Noyes
Martin County
County Administrative Center
2401 S.E. Monterey Road
Stuart, Florida 34996

RE: Martin County 4-Mile Restoration and Design, PRO-MAR-94-32

Dear Mr. Noyes:

We are pleased to inform you that the Florida Governor and Cabinet, at its meeting of September 15, 1992, approved the Department's FY 93-94 fixed capital outlay budget request for the projects referenced on the funding request summary forms enclosed. The Department will now submit its budget request to the Florida Legislature for funding consideration.

If we may be of any assistance to you, or if you have any questions regarding the appropriations process, please contact Bill Whitfield, Bill Wilkinson or me at (904)487-1262.

Sincerely,

Lonnie L. Ryder
Environmental Administrator
Office of Beach Management
Division of Beaches and Shores

LLR/bc

FRANK A. GACHA JEFF KRAUSKOPF WALTER W. THOM JR MAGGY HURCHALLA MARY E. DAWSON

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

ADM-IG 93-202

October 14, 1992

ATTACHMENT G

The Honorable Lawton Chiles
The Governor of the State of Florida
PL 05 the Capitol
Tallahassee, Florida 32399-0001

Dear Governor Chiles:

As Chairman of the Martin County Board of County Commissioners I am requesting your approval and support for the Department of Natural Resources' fixed capital outlay budget request for Fiscal Year 1993-94. Included in the FDNR's budget is an item that is extremely important to Martin County. It is a request for **$470,259** (Federal share $432,667 and Local share of $156,752) for the Preconstruction Engineering Design portion of a very badly needed 4-mile beach nourishment project on Hutchinson Island. The budget reference is known as **Martin County 4-Mile Restoration and Design, PRO-MAR-94-32.** To date the project has received $650,000 from the federal government to fund its share of the General Design Memorandum portion of the project.

Governor Chiles, over the past several months there has been accelerated beach erosion due to the severe storm conditions. As a result the properties of several residents are in jeopardy. Resulting from a recently completed beach profile by the USACOE it is recommending that an additional 300,000 cubic yards is needed to renourish the beach due to the average 62,000 cubic yard erosion loss that has taken place in the last three years, which clearly demonstrates the need to get the project done as soon as possible. We respectfully request that you include in your budget the PED funding for this greatly needed project. Without your help we will be unable to begin construction of the beach in a timely manner and provide the much needed storm protection to the residents of Hutchinson Island.

Please give this project your support for FY 93-94.

Yours truly,

Mary Dawson

Mary Dawson
Chairman

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

ATTACHMENT J-2

COUNTY OF MARTIN STATE OF FLORIDA

COM-MD-93-003L

October 20, 1992

Richard E. Bonner, P.E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Bonner:

On September 2, 1992, Martin County staff met with Congressman Lewis' staff concerning expediting the timetable for the Martin County Beach Nourishment Project. Congressman Lewis and his aides expressed a willingness to assist this project in any way possible. Both Martin County and Congressman Lewis are aware of the pressure that the Jacksonville District is under with the disaster recovery duties that is has undertaken in the aftermath of Hurricane Andrew. Congressman Lewis said that he would introduce an out of sequence appropriation for the construction of this project for fiscal year 1995 if the Corps can have the PED for the project completed in time for this construction timeframe. He also indicated that his office would work with the Jacksonville District to provide you with the resources and political support that you require to continue your efforts to expedite this project.

Martin County intends to request construction funding from the State through the Department of Natural Resources Beach Erosion Control Assistance Program and Federal funding through the Florida Public Works Program for fiscal year 1995. The application for funding through these programs starts in January, 1993. In order to apply for either program; Martin County, the Florida Department of Environmental Regulation, the Federal environmental agencies need to meet with the Jacksonville District to determine the environmental issues that will need to be addressed during the permitting phase of this project. A side benefit of this activity will be to provide front end input into the planning process to ensure that the permitting phase of this project will proceed smoothly. This meeting should take place no later than November 1992 so that agencies will have adequate time to provide written comments before funding applications are completed.

Martin County would appreciate your office coordinating the meeting described in the paragraph above. Further, if there is anything that Martin County or Congressman Lewis can do to assist you in your efforts on the Martin County Beach Nourishment Project, please do not hesitate to contact us.

Thank you for your attention to these matters.

Sincerely,

Mary E. Dawson

Mary E. Dawson
Chairman

MD/BD/lm

cc: Congressman Tom Lewis
Sue Whittle, County Administrator
Robert Denison, Parks and Recreation Director
Bonnie Dearborn, Intergovernmental Specialist
Donald Holloman, County Engineer

527

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FRANK A. WACHA
District 1

JEFF KRAUSKOPF
District 2

Vice Chairman
WALTER W. THOM, JR
District 3

MAGGY HURCHALLA
District 4

Chairman
MARY E. DAWSON
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

SUE B. WHITTLE • County Administrator

PHONE (407) 286 5422

COUNTY OF MARTIN STATE OF FLORIDA

COM-MD-93-003L

October 20, 1992

Richard E. Bonner, P.E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

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Thank you for your attention to these matters.

Sincerely,

Mary E. Dawson

Mary E. Dawson
Chairman

MD/BD/lm

cc: Congressman Tom Lewis
Sue Whittle, County Administrator
Robert Denison, Parks and Recreation Director
Bonnie Dearborn, Intergovernmental Specialist
Donald Holloman, County Engineer

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522

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C.S.

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

Parks & Recreation Dept.
Robert Denison, Director

2980 S.E. Dixie Hwy.
Stuart, Florida 34997
Phone (407) 288-5690
Recreation (407) 221-1418

September 28, 1992

Richard E. Bonner, P.E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

FILE: MS-LT-92-267.1

Dear Mr. Bonner:

On September 2, 1992 Martin County staff met with Congressman Lewis's staff concerning expediting the timetable for the Martin County Beach Nourishment Project. Congressman Lewis and his aides expressed a willingness to assist this project in any way possible. Both Martin County and Congressman Lewis are aware of the pressure that the Jacksonville District is under with the disaster recovery duties that it has undertaken in the aftermath of Hurricane Andrew. Congressman Lewis said that he would introduce an out of sequence appropriation for the construction of this project for fiscal year 1995 if the Corps can have the PED for the project completed in time for this construction timeframe. He also indicated that his office would work with the Jacksonville District to provide you with the resources and political support that you require to continue your efforts to expedite this project.

Martin County intends to request construction funding from the State through the Department of Natural Resources Beach Erosion Control Assistance Program and Federal funding through the Florida Public Works Program for fiscal year 1995. The application for funding through these programs starts in January, 1993. In order to apply for either program; Martin County, the Florida Department of Natural Resources, the Florida Department of Environmental Regulation, the Federal environmental agencies need to meet with the Jacksonville District to determine the environmental issues that will need to be addressed during the permitting phase of this project. A side benefit of this activity will be to provide front end input into the planning process to ensure that the permitting phase of this project will proceed smoothly. This meeting should take place no later than November, 1992 so that agencies will have adequate time to provide written comments before funding applications are completed.

Martin County would appreciate your office coordinating the meeting described in the paragraph above. Further, if there is anything that Martin County or Congressman Lewis can do to assist you in your efforts on the Martin County Beach Nourishment Project.

Thank you for your attention to these matters.

Sincerely,

Richard A. Noyes
Superintendent of Beaches and Waterways

cc: Congressman Tom Lewis
Sue Whittle, County Administrator
Robert F. Denison, Parks and Recreation Director
Bonnie Dearborn, Intergovernmental Specialist
Ron Jacobstien, FSBPA Martin County Chapter
Donald Holloman, County Engineer

RAN/kh

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

June 11, 1992

REPLY TO
ATTENTION OF
Programs and Project Management Division
Project Management Branch

Mr. Richard A. Noyes
Superintendent of Beaches and Waterways
2980 SE. Dixie Highway
Stuart, Florida 34997

Dear Mr. Noyes:

This is in response to your May 5, 1992, letter regarding the shore protection project that was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990.

Our office shares in your concern regarding the proposed construction start date of FY 1996. However, our recent experience on receiving approval of the General Design Memorandums (GDM) for the Manatee and Sarasota County shore protection projects, coupled with the requirement of having an approved GDM prior to requesting construction funds under the current budget process, will not allow us to schedule construction prior to FY 1996. Under the current 2-year budget process, the GDM for the Martin County project has to be approved by June 1994 in order to request funding from Congress for FY 1996 construction. A FY 1995 construction start would require GDM approval by June 1993. The amount of time required for GDM preparation and coordination and review required by our headquarters and other agencies (state and Federal) will not allow us to meet the June 1993 date.

Funding for preconstruction, engineering, and design (PED) is not a problem for this project. The review process which was previously mentioned is the determinant for this PED process.

Regarding the U.S. Army Corps of Engineers coordination meeting referenced in your letter, staff at our headquarters prefer that the technical review conference (TRC) not be held until significant work has been accomplished on the GDM. The early summer TRC would be premature as the District will be involved in data gathering and early stages of GDM preparation. The county's concern in regard to expediting the PED process and funding for the project is understood. Our office will maintain close coordination with the county on the preparation of

the necessary documents and proceed towards construction of the project as expediently as we can within our scheduling and funding capabilities.

I hope this information is sufficient for your needs. If you need additional information, please call Mr. Michael Schultz at 904-232-2112.

Sincerely,

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

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OH
CS CS
MS MAJ
6/26

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

Parks & Recreation Dept.
Robert Denison, Director

2980 S.E. Dixie Hwy.
Stuart, Florida 34997
Phone (407) 288-5690
Recreation (407) 221-1418

June 11, 1992 FILE: MS-LT-92-186.1

Don Keirn, Planning Manager
Southeast Florida Field Office
Department of Natural Resources
Division of State Lands
7400 H. South Georgia Avenue
West Palm Beach, Florida 33405

Dear Sir:

Martin County and the United States Army Corps of Engineers are working toward construction of a 23,000 foot beach nourishment project on the north end of Hutchinson Island in the County. The project consists of hydraulically dredging 1 million cu. yds. of sand from an offshore borrow site and placing it on the beach. Design features include reconstruction of the historical dune, a 35 foot storm protection berm and an 85' wide recreational beach. This project is expected to be built in 1995. The USACOE has just initiated work on the General Design Memorandum. * No FY 96

Martin County is interested in determining your office's requirements to obtain easements for the project area, erosion control line, borrow site and anything else your office has jurisdiction over pertaining to a beach nourishment project. Please send information on this subject to the address listed above. Feel free to contact me at Suncom 239-5690 or (407) 288-5690.

Thank you for your assistance in this matter.

Sincerely,

Richard A. Noyes

Richard A. Noyes
Superintendent of Beaches and Waterways

cc: Robert F. Denison, Parks and Recreation Director
cc: Mike Schultz
RAN/kh

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

ENGINEERING DEPARTMENT

PHONE (407) 288-5927 | Donald E. Holloman, P.E. DIRECTOR | SUNCOM 239-5927 FAX 288-5432

April 23, 1992 EN/CI-92L-281

Colonel Terrence Salt
Commander and District Engineer
United States Army Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, FL 32232-0019

Re: Martin County

Dear Colonel Salt:

We would very much appreciate an opportunity to meet with you to discuss, and perhaps visit, some Martin County sites of mutual interest and concern. We have heard that you may be in this area sometime during May, and it is our hope that you can arrange to spend some time with us then.

If your plans do not include a trip to Martin County in May, is there another time that we could arrange such a meeting?

Areas of concern include:

1) Two (2) roadway projects - MacArthur Boulevard and South Beach Road, where erosion is creating a public safety hazard
2) Beach Renourishment Project
3) St. Lucie Inlet
4) Maintenance Dredging at Crossroads
5) Okeechobee Park

I look forward to meeting you. A call to my office for myself, Ms. Kim Roden, or Mr. Lee Weberman will quickly facilitate arrangements for a meeting which I feel would be most beneficial to Martin County as well as the Army Corps.

Sincerely,

DE Holloman

Donald E. Holloman, P.E.
County Engineer

DEH/JL/pmr

cc: County Commissioners, Martin County
Sue B. Whittle, County Administrator
Robert Denison, Director, Parks Department
Richard Noyes, Superintendent of Beaches & Waterways
James Spurgeon, Town Manager, Town of Jupiter Island

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

ENGINEERING DEPARTMENT
PHONE (407) 288-5927 Donald E. Holloman, P.E. DIRECTOR SUNCOM 239-5927 FAX 288-5432

March 12, 1992 EN/CI-92L-224

Colonel Terrence Salt
District Engineer
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Re: Request for Investigation of Severe Erosion
1) MacArthur Boulevard, 2) South Beach Road

Dear Colonel Salt:

Martin County would like to request an investigation of two (2) beach sites within the County which have experienced severe erosion, causing damage to roadways which provide evacuation routes and adversely influencing public safety.

The two (2) sites are:

1) The northern most end of Bathtub Reef Park on MacArthur Boulevard. Further description can be provided by Mr. Richard Noyes, Superintendent of Beaches and Waterways, Martin County, (407) 288-5690.

2) Just south of 383 South Beach Road on Jupiter Island. This area is between Range 109 - 110, the DNR identifying markers from the Coastal Construction Control Line map. Further description can be provided by Mr. James Spurgeon, Town Manager, Town of Jupiter Island, (407) 546-5011.

Please advise us as to the results of your investigation, what funding is available, and when corrective work can be implemented. We are extremely concerned about the impact of this erosion on these vital roadways, and appreciate your prompt attention to this matter.

Severe Erosion
Page 2
EN/CI-92L-224

If you have any questions and/or to have someone from Martin County meet you at the sites, please contact Ms. Jill Lutes, Capital Projects Coordinator, of this office, Suncom 239-5927, or local, (407) 288-5927.

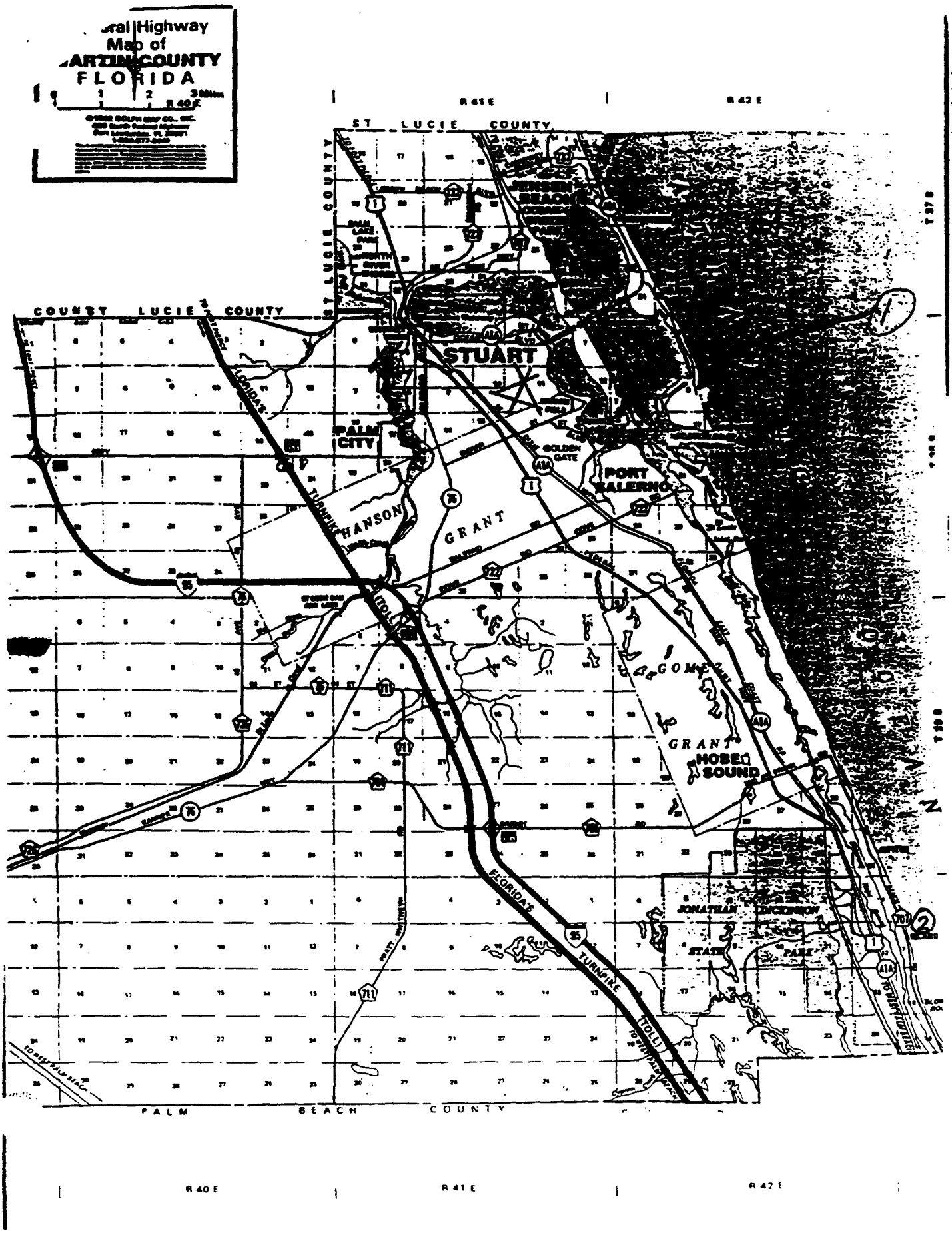
Sincerely,

D E Holloman

Donald E. Holloman, P.E.
County Engineer

DEH/JL/pmr

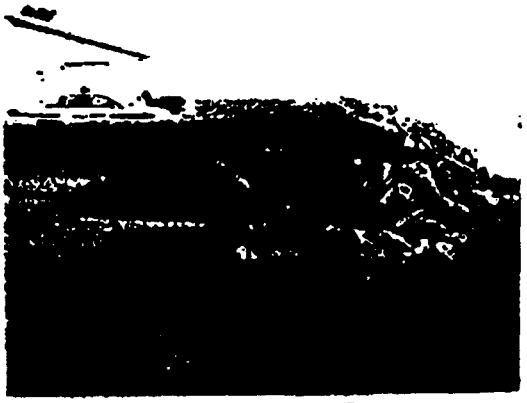
cc: County Commissioners, Martin County
Sue B. Whittle, County Administrator, Martin County
James Spurgeon, Town Manager, Town of Jupiter Island
Robert Denison, Director, Parks Department, Martin County
Richard Noyes, Superintendent of Beaches & Waterways, Martin County


ral Highway
Map of
ARTIN COUNTY
FLORIDA
R 40 E
R 41 E
R 42 E
ST LUCIE COUNTY
COUNTY LUCIE COUNTY
JENSEN BEACH
STUART
PALM CITY
GOLDEN GATE
PORT SALERNO
HANSON
GRANT
GRANT
HOBE SOUND
JONATHAN DICKINSON STATE PARK
FLORIDA'S TURNPIKE
TOLL
PALM BEACH COUNTY
R 40 E
R 41 E
R 42 E

02-12-92
SOUTH SIDE OF NORMAN
NO. ELEVATION

02-12-92 - FROM NORMAN TO BOIES.
SOUTH ELEVATION 383 SOUTH BEACH
JUPITER ISLAND

02-12-92 - WOBST IN BACK GROUND.
WEST ELEVATION 383 So. BEACH
JUPITER ISLAND



02-12-92 SOUTH SIDE OF NORMAN
NORTH ELEVATION 383 SOUTH BEACH
JUPITER ISLAND

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 1
To Mike Smith	From Jim Stringer
Co. Army Corps of Eng.	Co. Town of Jupiter Fl.
Dept.	Phone # 407-546-5011
Fax # 1-904-791-2251	Fax # 407-546-6225

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

March 6, 1992

REPLY TO
ATTENTION OF
Programs and Project Management Division
Project Management Branch

Ms. Sue B. Whittle
County Administrator
2401 SE. Monterey Road
Stuart, Florida 34996

Dear Ms. Whittle:

This is in response to your February 7, 1992, letter regarding the shore protection project that was authorized for the northern 4 miles of Hutchinson Island in Martin County by the Water Resources Development Act of 1990.

Our office appreciates your concern for expediting the preconstruction engineering and design (PED) process. We intend to utilize all available information to the extent practicable during PED. This will include the consultant's reports on the environmental and geotechnical studies that have already been provided by Martin County and the data from the Coast of Florida Erosion and Storm Effects study. It is currently anticipated that the Coast of Florida study would be initiating a feasibility study along that region of the Atlantic coast during the timeframe that the Plans and Specificiations (P&S) are being prepared for this project. Therefore, data from the study may not be available for use during PED.

The current schedule for completion of PED is for preparation of an economic update, a General Design Memorandum (GDM), and P&S by September 1995. The GDM is needed to update the project to current site conditions and current Federal guidelines, in order to prepare for construction. The P&S are needed in order to advertise a construction contract. It is anticipated that the GDM can be completed and approved by the latter part of 1993 with the provision of additional funds in FY 93. P&S would be initiated in FY 94 and completed in FY 95 with additional funds. A capability to expend construction funds would not be expressed under the normal budget process until after approval of the GDM. Since the budget cycle is 2 years ahead of the current fiscal year, the expenditure of construction funds would not be anticipated until FY 96 based upon approval of the GDM in the latter part of 1993 or early in FY 94. The initiation of construction would be subject to the availability of funds.

The county's concern in regard to expediting the PED process and funding for the project is understood. Our office will maintain close coordination with the county on the preparation of

the necessary documents and proceed towards construction of the project as expediently as we can within our scheduling and funding capabilities.

I hope this information is sufficient response for your needs. If you need additional information, please call Mr. Charles Stevens at 904-791-2113.

Sincerely,

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

MAR 02 1992

Programs and Project Management Division
Project Management Branch

Mr. Richard C. Higgins, Jr.
1550 NE. Ocean Boulevard
Hutchinson House #203C
Stuart, Florida 34996

Dear Mr. Higgins:

This is in regard to your January 18, 1992, letter regarding shore protection for Martin County, Florida. Congress, by means of the Water Resources Development Act of 1990, authorized a shore protection project for the northern 4 miles of Martin County on Hutchinson Island. We have recently initiated preconstruction engineering and design (PED) for this project. PED includes the preparation of a General Design Memorandum (GDM) and plans and specifications (P&S). The GDM is a report that updates the project scope, cost, environmental considerations, etc. to current site conditions and guidelines. P&S must be prepared in order to advertise a construction contract and are scheduled for completion by September 1995. A capability to expend construction funds would not be expressed under the normal budget process until after approval of the GDM.

The groin referenced in your letter will be evaluated as part of P&S preparation to determine whether any modification will be needed for safety reasons. If you need additional information, please call Mr. Charles Stevens, the project manager, at 904-791-2113.

Sincerely,

SIGNED: Richard E. Bonner

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

MSchultz/CESAJ-DP-I
le/3137 2/14, 28
CStevens/CESAJ-DP-I
DDuke/CESAJ-DP-A
RBonner/CESAJ-DP

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

February 24, 1992

Programs and Project Management Division
Project Management Branch

Honorable Tom Lewis
House of Representatives
Rayburn House Office Building
Washington, DC 20515

Dear Mr. Lewis:

This is in response to your January 16, 1992, letter regarding the shore protection project that was authorized for 4 miles on Hutchinson Island in Martin County by the Water Resources Development Act of 1990. As discussed in the January 7, 1992, letter from Ms. Mary Dawson, our office has initiated Preconstruction Engineering and Design (PED) for the project.

The current schedule for completion of PED is for preparation of an economic update, a General Design Memorandum (GDM), and Plans and Specifications (P&S) by September 1995. The GDM is needed to update the project to current site conditions and current Federal guidelines in order to prepare for construction. The P&S are needed in order to advertise a construction contract.

Our FY 92 work allowance provided $310,000 to initiate PED. It is anticipated that the GDM can be completed and approved by the latter part of 1993 with the provision of additional funds in FY 93. P&S would be initiated in FY 94 and completed in FY 95 with additional funds. A capability to expend construction funds would not be expressed under the normal budget process until after approval of the GDM.

The county's concern in regard to expediting the PED process and funding for the project is understood. Our office will maintain close coordination with the county on the preparation of the necessary documents and proceed towards construction of the project as expediently as we can within our scheduling and funding capabilities. As discussed in your letter and in a telephone conversation between Ms. Ann Decker of your office and Mr. Charles Stevens of our office on February 11, 1992, we will be glad to send a representative to Martin County to discuss their concerns.

I hope this information provides a sufficient response to your letter. If any additional information or assistance is needed, please call me or Mr. Richard Bonner, Deputy District Engineer for Project Management, at 904-791-2586.

Sincerely,

Terrence C. Salt
Colonel, U.S. Army
District Engineer

Copy Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Ms. Mary Dawson, Chairman, Martin County Board of County Commissioners, 2401 S.E. Monterey Road, Stuart, Florida 34996

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

February 24, 1992

REPLY TO
ATTENTION OF:

Programs and Project Management Division
Project Management Branch

Honorable Bob Graham
United States Senator
ATTN: Ms. Becky Liner
Post Office Box 3050
Tallahassee, Florida 32315

Dear Senator Graham:

This is in response to your January 29, 1992, letter regarding the shore protection project that was authorized for 4 miles on Hutchinson Island in Martin County by the Water Resources Development Act of 1990. As discussed in the January 7, 1992, letter from Ms. Mary Dawson, our office has initiated Preconstruction Engineering and Design (PED) for the project.

The current schedule for completion of PED is for preparation of an economic update, a General Design Memorandum (GDM), and Plans and Specifications (P&S) by September 1995. The GDM is needed to update the project to current site conditions and current Federal guidelines in order to prepare for construction. The P&S are needed in order to advertise a construction contract.

Our FY 92 work allowance provided $310,000 to initiate PED. It is anticipated that the GDM can be completed and approved by the latter part of 1993 with the provision of additional funds in FY 93. P&S would be initiated in FY 94 and completed in FY 95 with additional funds. A capability to expend construction funds would not be expressed under the normal budget process until after approval of the GDM.

The county's concern in regard to expediting the PED process and funding for the project is understood. Our office will maintain close coordination with the county on the preparation of the necessary documents and proceed towards construction of the project as expediently as we can within our scheduling and funding capabilities.

I hope this information provides a sufficient response to your letter. If any additional information or assistance is needed, please call me or Mr. Richard Bonner, Deputy District Engineer for Project Management, at 904-791-2586.

Sincerely,

Terrence C. Salt
Colonel, U.S. Army
District Engineer

Copy Furnished:

Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)
Ms. Mary Dawson, Chairman, Martin County Board of County Commissioners, 2401 S.E. Monterey Road, Stuart, Florida 34996

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

February 12, 1992

Programs and Project Management Division
Project Management Branch

Mr. Richard Noyes
Superintendent of Beaches and Waterways
2401 N. Federal Highway
Stuart, Florida 34996

Dear Mr. Noyes:

This is in response to your January 6, 1992, letter regarding the shore protection project that was authorized for Martin County on Hutchinson Island by the Water Resources Development Act of 1990.

Our office appreciates your assistance and the update you provided on the existing conditions along the project area during the November 13, 1991, design conference in Jacksonville. The Memorandum for the Record for the design conference will be sent to you as soon as it is approved by our headquarters. We intend to utilize all available information to the extent practicable during preconstruction engineering and design (PED) of the project. Thank you for the consultant's reports on the environmental and geotechnical studies that you have already provided for our use. Please contact Mr. Michael Dupes of our office at 904-791-2325 to determine whether the digitized environmental data you mentioned in your letter can be utilized during the preparation of the design documents for the project.

As discussed with Mr. Charles Stevens of our office on February 6, 1992, the current schedule for completion of PED is for preparation of an economic update, a General Design Memorandum (GDM), and Plans and Specifications (P&S) by September 1995. The GDM is needed to update the project to current site conditions and current Federal guidelines in order to prepare for construction. The P&S are needed in order to advertise a construction contract.

In FY 92 our work allowance provided ~~$350,000~~ $310,000 to initiate PED. The current estimate of the funding that will be needed to complete PED is $300,000 in FY 93 for completion of the GDM, $100,000 in FY 94 to initiate the P&S, and $200,000 in FY 95 to complete the P&S. This schedule and cost estimate is subject to change as we proceed towards construction.

It is anticipated that the GDM can be completed and approved by the latter part of 1993. After approval of the GDM, initiation of construction is dependent upon congressional funding.

The county's concern in regard to expediting the PED process and funding for the project is understood. Our office will maintain close coordination with the county on the preparation of the necessary documents and proceed towards construction of the project as expediently as we can within our scheduling and funding capabilities.

I hope that this information is sufficient for your needs. If you need additional information, please call Mr. Charles Stevens at 904-791-2113.

Sincerely,

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

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BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

PARKS DEPARTMENT
2980 S.E. Dixie Hwy.
Stuart, Florida 34997

Robert Denison, Director

Phone (407) 28

October 14, 1991 File: MS-LT-92-014.1

Charlie Stevens, Project Manager
U.S. Army Corp of Engineers
Jacksonville District
CESHA-DP-1
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Stevens:

Enclosed are copies of the Summary Report and the Coastal Engineering and Environmental Studies for the Martin County 4 Mile Beach Nourishment Project. These studies were commissioned by the Martin County Board of Commissioners to explore indepth the environmental issues surrounding this project and establishing the baseline preproject conditions within the project area.

There is still a baseline turbidity monitoring study that has not been completed but will be sent to you once it is delivered.

These documents are for the use of your office. If you have any questions, please contact this office at the above phone number.

Sincerely,

Richard A. Noyes

Richard A. Noyes
Superintendent of Beaches and Waterways

Enclosures ALREA
Provided to Dr. Atm
10/23/91

cc: Robert F. Denison, Parks Director

RAN/kh

FRANK A WACHA
District 1

JEFF KRAUSKOPF
District 2

WALTER W. THOM, JR.
District 3

Chairman
MAGGY HURCHALLA
District 4

Vice Chairman
MARY E. DAWSON
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

JOSEPH R. GRASSIE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN STATE OF FLORIDA

October 10, 1991 File: CO-92-MH-12A

Richard E. Bonner, P. E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Bonner,

Martin County has been approached to provide correspondence to the Martin County Chapter of the Florida Shore and Beach Preservation Association that pertains to the 4 Mile Beach Nourishment Project on Hutchinson Island. At the regular meeting of the Board of County Commissioners on September 24, 1991, the Board voted to request that your office copy this organization directly with any correspondence pertaining to this project and send it to:

The Martin County Chapter
Florida Shore and Beach Preservation Assn.
c/o 2355 Northeast Ocean Blvd.
Stuart, FL 34996

Please contact Richard Noyes, Superintendent of Beaches and Waterways in the Parks and Recreation Department if you require further information.

Thank you for your cooperation in this matter.

Sincerely,

Maggy Hurchalla, Chairman

cc: Frank A. Wacha, County Commissioner
Sue Whittle, County Administrator
David Collier, Assistant County Administra
Kay Curiel, President, Martin County Chapt FSBPA

RFD/RAN/kh

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GSV
MS
MAL 9/19/

September 12, 1991

Programs and Project Management Division
Project Management Branch

Mr. Richard A. Noyes
Superintendent of Beaches and Waterways
2401 SE. Monterey Road
Stuart, Florida 34996

Dear Mr. Noyes:

This is in response to your June 17, 1991, letter regarding the shore protection project that was authorized for the northern 4 miles of Martin County on Hutchinson Island by the Water Resources Development Act of 1990. As you know, the FY 92 budget contains $350,000 to initiate Preconstruction Engineering and Design (PED) for this project. However, no work can begin until a work allowance is provided by our higher authority. At present, it is anticipated that PED may be initiated around November 1991. Additional funds will be required to complete PED.

When the FY 92 work allowance is provided, our office will initiate preparation of the General Design Memorandum (GDM), which is a report that updates the project to current site conditions and current Federal guidelines in order to prepare for construction. In addition, PED includes preparation of the Plans and Specifications (P&S) that are needed in order to advertise a construction contract. The initiation of construction will depend upon the availability of funds.

Our office will coordinate the schedule for completion of the GDM with Martin County when the FY 92 work allowance is provided. In general, a GDM requires about 2 years to complete. During the second year, P&S can sometimes be initiated when funds are available and the GDM is nearing completion. However, sufficient review of the GDM has to be accomplished prior to initiating the P&S. The P&S usually require about 1 year to complete. A Local Cooperation Agreement (LCA) will also have to be executed prior to advertisement of the construction contract. Advertisement and award of the contract generally require a total of 2 months after approval of the GDM, P&S, and execution of the LCA.

We will be glad to hold a meeting either at our District office or at your office when PED is initiated. In order to

determine the scope of the field work that will need to be accomplished during PED, we will coordinate with Martin County to ensure that the data acquired by the county since completion of the feasibility report in 1985 is utilized to the maximum extent practicable. At the present time, planning for the non-Federal source of the project's construction cost is an important item that the county may want to continue to pursue.

I hope that this information is sufficient for your needs. If you need additional information, please call Mr. Charles Stevens at 904-791-2113.

Sincerely,

Joseph R. Burns

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

Joseph R. Burns
Executive Assistant

CStevens/CESAJ-DP-I
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DDuke/CESAJ-DP-A
EMiddleton/CESAJ-EN
RBonner/CESAJ-DP

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

June 24, 1991

Programs and Project Management Division
Project Management Branch

Honorable Connie Mack
United States Senator
1342 Colonial Boulevard
Suite 27
Fort Myers, Florida 33907

Dear Senator Mack:

This is in response to your June 3, 1991, letter regarding the shore protection project that was authorized for Hutchinson Island in Martin County by the Water Resources Development Act of 1990. As discussed in our March 7, 1991, letter to Mrs. Maggy Hurchalla, a copy of which is enclosed, our office is prepared to initiate Preconstruction Engineering and Design (PED) when Federal funds are provided. The President's FY 92 budget included $350,000 to initiate PED. As you know, work can not begin until the Congressional appropriations committee includes this in an appropriations bill and a work allowance is provided by our higher authority.

When funds are provided for the initiation of PED, our office will coordinate a schedule for completion of the General Design Memorandum (GDM) with the Martin County Board of County Commissioners. The GDM is a report that updates the project to current site conditions and current Federal guidelines in order to prepare for construction. In addition, PED includes preparation of the Plans and Specifications that are needed in order to advertise a construction contract. The initiation of construction will depend upon the availability of funds.

A Local Cooperation Agreement (LCA) will be required to be executed between Martin County, acting as the local sponsor, and the Assistant Secretary of the Army for Civil Works (ASA(CW)) prior to construction. A financing plan for provision of the non-Federal share of the project's cost will be needed from Martin County and will be part of the LCA package that is forwarded to the ASA(CW). These documents will be prepared when the GDM is nearing completion. All that is needed from Martin County at this time is a letter indicating their continued support for and willingness to cost share in the project. This information was provided in their March 26, 1991, letter and is satisfactory for our purposes.

I hope that this information provides a sufficient response to your letter. If any additional information or assistance is needed, please call me or my Deputy for Project Management, Mr. Richard Bonner, at 904-791-2586.

Sincerely,

Bruce A. Malson
Colonel, U.S. Army
District Engineer

Enclosure

Copy Furnished (w/Encl):
Commander, U.S. Army Corps of Engineers (CECW-L)
Commander, South Atlantic Division (CESAD-PM)

Copy Furnished (wo/Encl):
Mrs. Maggy Hurchalla
Chairman, Martin County
Board of County Commissioners
2401 S.E. Monterey Road
Stuart, Florida 34996

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APR 22 1991

Programs and Project Management Division
Project Management Branch

Ms. Marjorie Belcher
Performance 500 Properties
500 N. Federal Highway
Stuart, Florida 34994

Dear Ms. Belcher:

This is in response to your February 19, 1991, letter regarding the shore protection project that was authorized for the northern four miles of Martin County on Hutchinson Island by the Water Resources Development Act of 1990. The President's FY 92 budget included $350,000 to initiate Preconstruction Engineering and Design (PED). However, no work can begin until the Congressional Appropriations Committee includes this in an appropriations bill and a work allowance is provided by our higher authority. At present there is no schedule for the initiation of construction of the project.

When PED funds are provided, our office will prepare the General Design Memorandum (GDM), which is a report that updates the project to current site conditions and current Federal guidelines in order to prepare for construction. In addition, PED includes preparation of the Plans and Specifications that are needed in order to advertise a construction contract. The initiation of construction will depend upon the availability of funds. Our office will coordinate the schedule for completion of the GDM with the Board of County Commissioners, the local sponsor for the project, as soon as PED funds are provided.

The authorized project features consist of a beach fill cross section that includes: restoration of the primary dune width of 20 feet at an elevation of +12 feet Mean Sea Level (MSL), a 35 foot wide berm at +8 feet MSL, and a foreshore slope of 1 vertical on 8.5 horizontal (1V:8.5H) to mean low water, then 1V:20H to the existing bottom. In addition, approximately eight years of advanced nourishment would be placed in front of the design cross section during initial construction as part of the construction profile.

I hope that this information is sufficient for your needs. If you need additional information, please call Mr. Charles Stevens at 904-791-2740.

Sincerely,

SIGNED: Dennis R. Duke
Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

CStevens/CESAJ-DP-I
DDuke/CESAJ-DP-A
RBonner/CESAJ-DP

MAY-02-1991 10:10 FROM PARKS DEPARTMENT TO 8-9047911213 P.02

FILE COPY

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

COUNTY OF MARTIN STATE OF FLORIDA

PARKS DEPARTMENT
2980 S.E. Dixie Hwy.
Stuart, Florida 34997

Robert Denison, Director
Phone (407) 288-5690

April 22, 1991

File: MS-LT-91-148

Stan Tait, President
Florida Shore and Beach Preservation Association
864 East Park Avenue
Tallahassee, Florida 32301

Dear Stan:

Enclosed are abstracts for two talks:

1. Comprehensive Beach Management

2. The Political Process of a Beach Nourishment Project

The second talk is designed to kick off a series of talks by Applied Technology and Management, Mote Marine Laboratories Dr. Thomas Curtis, and the Army Corps of Engineers on the Proposed 4 Mile Beach Nourishment Project in Martin County.

Please contact this office if these topics are of interest for the annual meeting or if you have any questions or concerns.

Sincerely,

Rich Noyes

Richard A. Noyes
Superintendent of Beaches and Waterways

cc: Robert F. Denison, Parks Director

Enclosures

RAN/kh

ABSTRACT

COMPREHENSIVE BEACH MANAGEMENT

SPEAKER: Richard A. Noyes
Superintendent of Beaches and Waterways
Martin County Parks Department
2980 S. E. Dixie Hwy.
Stuart, Florida 34997 Phone: (407) 288-5690

This paper discusses beach management from a comprehensive perspective. It explores the major activities of beach management:

1. Growth management and strategic policy.
2. Beach operations including safety, security and maintenance.
3. Public facility development and coastal engineering.

Each one of these activities is broken out into its component parts so that each sub program can be examined and common management problems can be identified across disciplines. The paper discusses in detail the interrelation of all aspects of beach management and the resources available that can be shared by each player in a beach program.

FILE: MS91.019

MAY-02-1991 10:11 FROM PARKS DEPARTMENT TO 8-9047911213 P.04

ABSTRACT

THE POLITICAL PROCESS OF A BEACH NOURISHMENT PROJECT A CASE STUDY IN MARTIN COUNTY

SPEAKER: Richard A. Noyes
Superintendent of Beaches and Waterways
Martin County Parks Department
2980 S. E. Dixie Hwy.
Stuart, Florida 34997 Phone: (407) 288-5690

This talk is intended to lead into a panel discussion of the Martin County proposed 4 Mile Beach Nourishment Project. This talk will provide the overview of the political and staff process chosen to evaluate and campaign the beach erosion control alternatives and specifically look at the environmental, economic, regulatory, and political aspects of getting a Federal beach nourishment project off the ground. Other panel members will discuss the specific findings of the environmental study, economic study, Feasibility Study and inlet management study that all interrelate in Martin County.

FILE: MS91020

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C.S.

FRANK A WACHA
District 1

JEFF KRAUSKOPF
District 2

WALTER W. THOM, JR.
District 3

Chairman
MAGGY HURCHALLA
District 4

Vice Chairman
MARY E. DAWSON
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

JOSEPH R. GRASSIE • County Administrator

PHONE (407) 288-5422

COUNTY OF MARTIN STATE OF FLORIDA

March 26, 1991

File: CO-91-MH-313A

Richard E. Bonner, P. E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P. O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Bonner:

This letter indicates Martin County's support of the Proposed 4 Mile Beach Nourishment Project and its willingness to cost share in the design and construction of this project as approved unanimously by the Board at the regular meeting of the Board of County Commissioners on March 26, 1991.

Please let this office know if there is anything further that is needed to proceed with this project.

Sincerely,

Maggy Hurchalla
Chairman

cc: Florida Congressional Delegation

RAN/kh

MAR 7 1991

Programs and Project Management Division
Project Management Branch

Mrs. Maggy Hurchalla
Chairman
Martin County Board of County Commissioners
2401 S.E. Monterey Road
Stuart, Florida 34996

Dear Mrs. Hurchalla:

This is in regard to the shore protection project that was authorized for Hutchinson Island in Martin County by the Water Resources Development Act of 1990. As discussed during the County Commission meeting on January 22, 1991, by Mr. Charles Stevens of our office, we are prepared to initiate Preconstruction Engineering and Design (PED) when Federal funds are provided. The President's FY 92 budget included $350,000 to initiate PED. However, no work can begin until the Congressional appropriations committee includes this in an appropriations bill and a work allowance is provided by our higher authority.

When PED funds are provided, our office will prepare the General Design Memorandum (GDM), which is a report that updates the project to current site conditions and current Federal guidelines in order to prepare for construction. In addition, PED includes preparation of the Plans and Specifications that are needed in order to advertise a construction contract. The initiation of construction will depend upon the availability of funds.

At the initiation of PED we will coordinate a schedule for field data collection and completion of the GDM with your office. The field data to be collected during the first fiscal year that PED funds are provided will include a beach profile survey and additional borrow source information. These data will be incorporated into the economic analyses for the GDM.

A Local Cooperation Agreement (LCA) will be required to be executed between Martin County, acting as the local sponsor, and the Assistant Secretary of the Army for Civil Works (ASA(CW)) prior to construction. A financing plan for provision of the non-Federal share of the project's cost will be needed from Martin County and will be part of the LCA package that is forwarded to the ASA(CW). The non-Federal share of PED cost is based upon the final cost sharing percentage associated with the project and is included in the cost of construction. The non-Federal share of the PED cost is provided along with the non-Federal share of the construction cost for that year during the first year of construction.

Enclosed is a copy of the "Sponsor's Partnership Kit", which is a document prepared by the Corps of Engineers to familiarize local sponsors with implementation of projects.

At this time a letter is needed from the Martin County Board of County Commissioners indicating support for implementation of the project, and expressing a willingness to cost share in PED and construction of the project as the local sponsor.

I hope that this information will assist you in understanding the process that is underway for implementation of the project for Martin County. If you need additional information please call me at 904-791-2586, or Mr. Stevens, the project manager, at 904-791-2740.

Sincerely,

SIGNED: Richard E. Bonner

Richard E. Bonner, P.E.
Deputy District Engineer
for Project Management

Enclosure

Copy Furnished (w/encl):

Mr. Joseph R. Grassie
County Administrator
2401 S.E. Monterey Road
Stuart, Florida 34996

Ms. Bonnie Dearborn
Intergovernmental Relations
2401 S.E. Monterey Road
Stuart, Florida 34996

Mr. Richard A. Noyes
Director, Division of Marine Safety
Martin County Parks Department
2980 S.E. Dixie Highway
Stuart, Florida 34997

bcf:
CESAJ-EN-HC
CESAJ-PD
CESAJ-RE

FRANK A. WACHA
District 1

Chairman
TOM HIGGINS
District 2

Vice-Chairman
THOMAS G. KENNY, III
District 3

MAGGY HURCHALLA
District 4

JOHN W. HOLT, JR.
District 5

BOARD OF COUNTY COMMISSIONERS
50 Kindred Street • Stuart, Florida 33497

ROBERT H. OLDLAND • County Administrator

PHONE (305) 283-6760

COUNTY OF MARTIN STATE OF FLORIDA

CO-85-TJH-2
October 2, 1985

Colonel Charles T. Myers,III
District Engineer
U.S. Army Corps of Engineers
400 W. Bay Street
Jacksonville, FL 32232-0019

Dear Colonel Myers;

This is in reference to the draft feasibility report and environmental impact statement for beach erosion control in Martin County, Florida as provided for review by letter dated July 17, 1985 and as presented by the Corps of Engineers to the Martin County Commission at Public Meeting on August 27, 1985.

At this meeting the Commission authorized this letter of intent to comply with the items of local cooperation listed in the referenced report and presentation, following a presentation by our Staff on the report recommendations.

It is understood that the items of local cooperation will be specifically set forth with mutual accord in an agreement to be executed at a future date by the U.S. Army Corps of Engineers and Martin County. Such agreement shall be made contingent upon Congressional authorization and subject to the availability of funds for Martin County.

Sincerely,

Thomas J. Higgins
Chairman

TJH:RHO/kl

cc: A.J.Salem, Chief, Planning Division, Corps of Engineer
Board of County Commissioners
County Administrator
County Attorney
Public Works Director

Appendix E

Proposed Hardbottom Monitoring and Mitigation Plan

Martin County Shore Protection Project

Hutchinson Island, Martin County, Florida

PROPOSED HARDBOTTOM MONITORING AND MITIGATION PLAN

I. INTRODUCTION

Aerial photographs, side scan sonar surveys, and underwater visual assessments utilizing SCUBA have shown that coquina limestone outcrops and hardened structures built by the marine bristle worm, *Phragmatopoma lapidosa*, are found scattered throughout the Martin County portion of Hutchinson Island extending from the northern county line southward to the St. Lucie Inlet. The majority of this hardbottom habitat begins just offshore in approximately 8.0 feet (2.4m) of water and extends eastward to approximately 20.0 feet (6.1m) of water (refer to Appendix D). An interagency group of environmental scientists representing the U.S. Army Corps of Engineers (Corps), U.S. Fish and Wildlife Service (FWS), Florida Department of Environmental Protection (DEP), and Martin County Growth Management Department (County) made a series of underwater inspections of the area in July, 1993. The purpose of these inspections was primarily to ascertain the accuracy of the side scan sonar maps and to generalize many of the hardbottom reef tracts as they pertain to apparent biological productivity (and ecological importance).

A direct negative impact associated with beach nourishment projects is the possibility that these hardbottom areas may be completely buried from the placement of sand onto the eroded project beach. An indirect but equally important negative impact associated with placing sand onto an eroded beach is the possibility that the hardbottom habitat seaward of the project beach may be subjected to increases in turbidity, sedimentation, and resuspension of sediment into the water column. The degree to which these hardbottom areas may be impacted depends upon the type of geological material (% silt) settling on them, the physical dynamics of the area (such as waves and currents), the relief of the hardbottom habitat, the composition of the hardbottom habitat (limestone vs. living rock such as worm rock or scleractian corals), and the amount of encrusting or sessile organisms attached to the hardened structures.

The intertidal and nearshore waters along the project beach are very dynamic and possess high wave energy that routinely produces high turbidity, sedimentation, scouring, and periodically buries nearshore low relief hardbottom habitat. Such physically dynamic nearshore oceanographic conditions make assessing changes to the hardbottom habitat along the project area extremely difficult. Natural conditions found in this area tend to make turbid conditions and bottom scouring a routine occurrence. Furthermore, much of the low relief limestone habitat in shallow water is subjected to continual burial and re-

exposure depending upon the physical conditions at the time.

Based upon previous underwater assessments, a portion of the nearshore hardbottom habitat is not considered "ecologically important" and should not be subject to any mitigation - requirements. These low relief (less than 1.0 feet/0.3m) limestone outcrop areas are ephemeral in nature and support little or no encrusting or sessile organisms due to constant sand scouring. Because of the lack of food resources, few if any fish are observed around these areas. An attempt to locate and "classify" these areas will be undertaken prior to beach nourishment construction. The purpose of this classification is to determine which hardbottom areas contain permanent and significant biological communities and would therefore be "ecologically important" and subject to any future monitoring and mitigation efforts. This classification will be arrived at by an interagency team of environmental scientists assessing each reef tract with the aid of a classification form that is attached at the end of this Appendix.

In order to accurately document the permanency and biological productivity of the hardbottom habitat that may be subjected to possible impacts from the beach nourishment project, it is essential to undertake a thorough pre- and post-construction monitoring plan. By statistically comparing data collected within the project area to baseline conditions outside the project area (control stations), it may be possible to attribute any increases in turbidity, sedimentation rates, and scouring events to the placement of sand onto the eroding project beach. With the aid of computer models, coastal engineers currently estimate that the beach nourishment project will not directly impact (bury) any hardbottom habitat adjacent to the fill area.

It is anticipated that the gradual flow of sand from the project beach south towards the St. Lucie Inlet over a period of years will not pose any secondary impacts to the hardbottom areas located south of the project area (approximately between monuments R-23 and R-42). Whether or not these areas are actually impacted or not will be quantitatively assessed with the aid of an extensive and thorough monitoring program.

II. MONITORING PLAN

A total of nine (9) transects will be placed across hardbottom areas. The exact locations of these transects can be seen in Appendix D. The location of these sampling transects within and just south of the project area is also included at the end of this Appendix. Of the nine transects, one is located north of the project area, four within the project area, and four south of the project area. The criteria for sampling selection

was cumulative number of reef tracts present, distance (west to east) from mean high water, and distance from project area (north-south). The locations of these transects are expected to be sensitive to seaward shifts of sand as the renourished beach reaches equilibrium with the surrounding topography as well as any sand transported south due to longshore drift.

Assessing the hardbottom habitat within the possible influence of the beach fill project will consist of undertaking the following:

a. changes in overall **sedimentation levels** will be quantified by installing a PVC stake adjacent to a selected hardbottom area and measuring from a predetermined measuring point down to the sediment surface. This will determine the changes (height) in bottom sediment levels over time. All appropriate safety measures will be undertaken to ensure that the stake will not present any hazard to swimmers or surfers.

b. natural and project induced changes in **suspended solids** will be quantified by installing sediment traps/tubes one meter off the bottom as well as taking secchi depths from a boat during each sampling visit. A turbidimeter will be used to assess turbidity conditions *in situ*.

c. important **physiochemical parameters** such as water temperature, salinity, and dissolved oxygen will be measured during each sampling trip.

d. any change to **encrusting organisms** or **sessile algae** will be quantified utilizing a slight variation of the photogrammetric belt quadrat method. Briefly, this technique involves selecting $0.5m^2$ permanent quadrat stations along a 30m transect line. By analyzing underwater photographs of permanent quadrats, changes in abundance, biodiversity, and percent coverage will be quantified. Only those areas that presently have encrusting or sessile organisms on them will be selected.

e. along the 30m transect line used for photogrammetric assessment, a **fish census** utilizing a modified *Bohnsack-Bannerot Stationary Visual Census Technique* will be undertaken. This technique will allow information such as abundance, diversity, and estimated fish biomass to be collected during each sampling visit. A video will also be shot along the transect line.

f. a quantitative as well as qualitative list of **epibenthic macroinvertebrates** will be established along the 30m transect line.

g. interstation and intrastation **statistical comparisons** will be made in relation to control stations established north

and south of the project area. SAS along with a one-way ANOVA and *t-test* will be used to statistically compare pre- and post-project variables.

Just seaward of the projected equilibrium toe of fill influence (see Appendix D), there are numerous large sandy areas. It is these sandy areas adjacent to living worm rock habitat that will be the location for any future hardbottom mitigation requirements. The type of material to be used depends entirely on what type of material is available at that time as well as the location of the material that becomes available from. Every effort will be made to place flat and smooth clean concrete or limestone on sandy areas adjacent to existing worm rock. It is expected that the flat hard material will settle in the sand and allow for the remainder of the material to be placed on top of a hard substrate. An appropriate amount of various sized and shaped materials will be placed on this flat bedding material. By placing irregularly shaped material on top of itself, the amount of refuge space available to juvenile and cryptic species is increased. It is estimated that this material will be colonized by the adjacent sabellariid larvae as well as a variety of encrusting and sessile invertebrates. The hardbottom material will be brought to the area and dropped into the water by barge.

Pre- and post-monitoring by a selected contractor(s) will monitor selected areas approximately six (6) times per year (weather permitting) for a total of two years. The locations of these samplings transects are found in Appendix D. Past renourishment projects have indicated that infauna invertebrates along with motile species usually return to pre-construction abundances within two years after construction. Scientists from the Corps, FWS, National Marine Fisheries Service (NOAA), DEP, County, and the Florida Oceanographic Society will be invited by the selected contractor to participate in the monitoring activities prior to each field trip. Quarterly sampling will be undertaken to ascertain the level of seasonal variability. Two (2) additional sampling events will be taken just before and just after a "storm event" to assess changes attributed to the dynamic conditions found within the project area. It is important to note that physical conditions will be measured to determine what conditions were present that designated it as a storm event.

An annual report listing data collected and discussion of results to date and any possible trends will be produced. A final report will be written which assesses pre- and post-project variability and describes what impact, if any, the placement of sand on the beach may have had on adjacent biological resources.

CHARACTERIZATION OF HARDBOTTOM HABITAT
MARTIN COUNTY SHORE PROTECTION PROJECT
HUTCHINSON ISLAND, MARTIN COUNTY, FLORIDA

REEF TRACT LOCATION :

GENERAL HABITAT CHARACTERIZATION (POINTS ASSIGNED)

REEF RELIEF

0 : < 1 FOOT

3 : 1-3 FEET

5: > 3 FEET

____

POINTS

ENCRUSTING/SESSILE ORGANISMS

0 : < 10% COVERAGE

3 : 10% - 50% COVERAGE

5 : > 50%

____

POINTS

EPIFAUNAL ABUNDANCE

0 : SCARCE (#^{s}/unit)

3 : MEDIUM (#^{s}/unit)

5 : PLENTIFUL (#^{s}/unit)

____

POINTS

FISH ABUNDANCE

0 : SCARCE (#^{s}/unit)

3 : MEDIUM (#^{s}/unit)

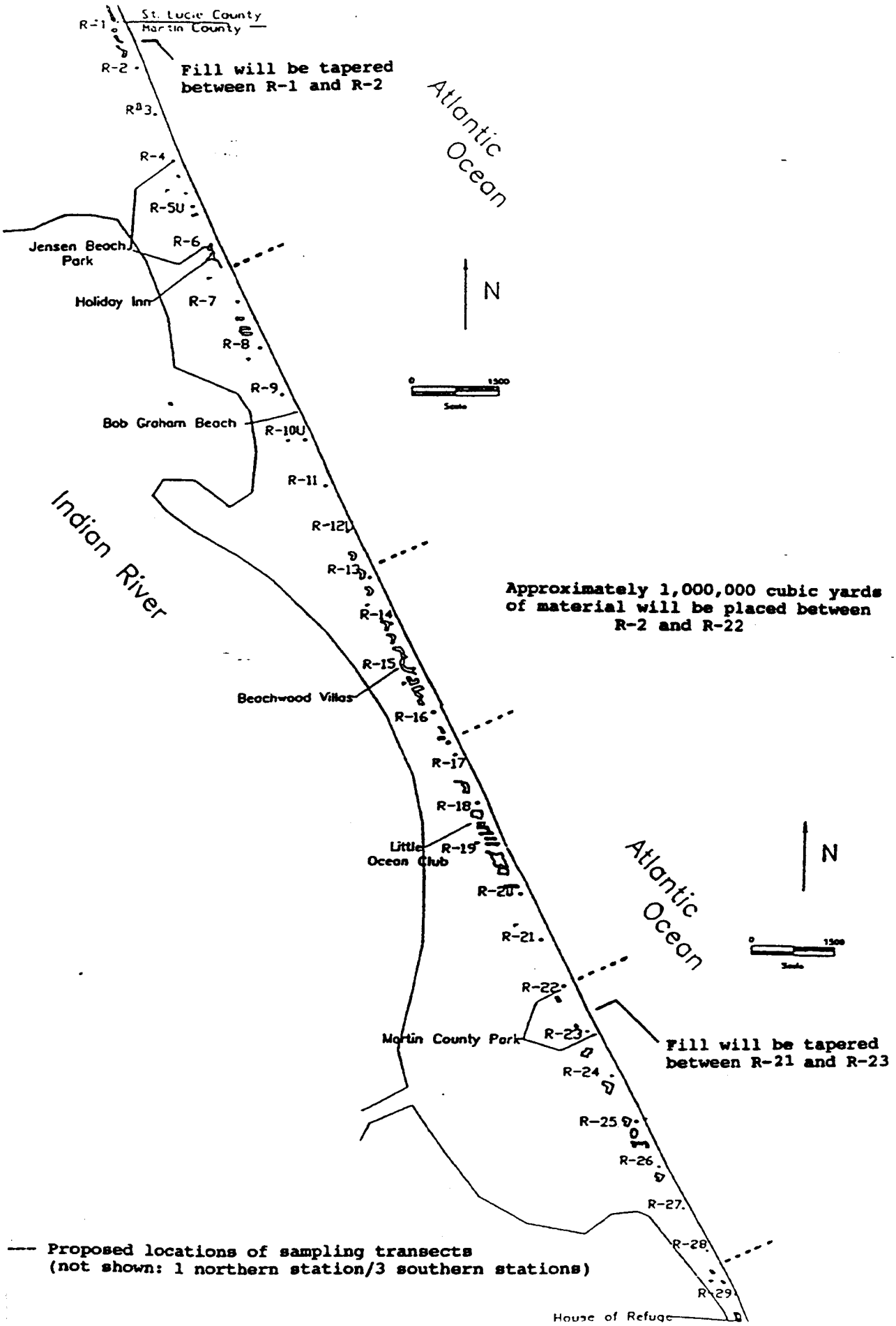
5 : PLENTIFUL (#^{s}/unit)

____

POINTS

AVERAGE =

REMARKS :


St. Lucie County
Martin County
R-1
R-2
Fill will be tapered between R-1 and R-2
R-3
R-4
R-5U
R-6
Jensen Beach Park
Holiday Inn
R-7
R-8
R-9
Bob Graham Beach
R-10U
R-11
R-12U
R-13
R-14
R-15
Beachwood Villas
R-16
R-17
R-18
Little Ocean Club
R-19
R-20
R-21
R-22
Martin County Park
R-23
R-24
R-25
R-26
R-27
R-28
R-29
House of Refuge
Atlantic Ocean
Indian River
N
0
1500
Scale
Approximately 1,000,000 cubic yards of material will be placed between R-2 and R-22
Atlantic Ocean
N
0
1500
Scale
Fill will be tapered between R-21 and R-23
--- Proposed locations of sampling transects
(not shown: 1 northern station/3 southern stations)

Appendix F

Relevant Correspondence

Martin County Shore Protection Project

Hutchinson Island, Martin County, Florida

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MARSHAL L. WILCOX
District 1

JEFF KRAUSKOPF
District 2

JANET K. GETTIG
District 3

MAGGY HURCHALLA
District 4

CHARLENE HOAG
District 5

BOARD OF COUNTY COMMISSIONERS
2401 S.E. Monterey Road • Stuart, Florida 34996

PHONE (407) 288-5400

COUNTY OF MARTIN STATE OF FLORIDA

June 9, 1994

ENG-CI-94-352L

Richard E. Bonner, P.E.
Deputy District Engineer for
Project Management
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

4-Mile Beach Renourishment Project
Martin County Project # 93E-CP-004

Dear Mr. Bonner:

This letter indicates Martin County's support for the reduction in the length of the beach nourishment project, and increasing the taper at the southern end. We agree with the Districts efforts to avoid direct environmental impacts to the hardgrounds at the southern end of the project. By these actions, we believe the District has developed an environmentally acceptable plan from the Federal, State, and local governments prospective.

Please let this office know is there is anything further that is needed to proceed with this project.

Sincerely,

Donald E. Holloman, P.E.
County Engineer

DEH:LAW:bb
s:\cip\ci352l.law

cc: Peter Cheney, County Administrator

Florida Department of
Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

May 3, 1994

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

Dear Mr. Salem:

Thank you for your letter providing a content and discussion summary of the meeting held on January 25, 1994, between Robert Brock, John Abendroth, and Mike Sole. In general, the contents of the document are an accurate depiction of the discussions held between our staff. However, I would like to point out some clarifications on a couple of issues.

Item number 1 identifies that the equilibrium toe line is considered accurate at this time. However, the Bureau of Wetland Resource Management has requested clarification of the projected equilibrium toe of fill for this project. The local sponsor's agent has submitted revised drawings which depict the construction toe of fill in a similar location as the projected equilibrium toe of fill in the "draft" General Design Memorandum for this project. Please contact Mr. John Abendroth of the Bureau of Wetland Resource Management for further information on this issue.

Item number 12 identifies the use of a nutrient "jump start" in dune plantings. This is presently considered to be acceptable in specific locations in which interaction with marine turtles is not considered to occur. More specifically, placing a form of compost, landward of the dune crest where marine turtle nesting activity is not anticipated, is acceptable.

Regarding item number 14, a post and rope fence should be used in regions where significant pedestrian activity is anticipated (such as public parks and accesses). Placing these structures along the entire project area may result in increased interaction with marine turtles, and upon significant storm events, increased waterborne debris. Appropriate locations for use should be further identified.

Printed on recycled paper

Mr. A. J. Salem
May 3, 1994
Page Two

Again, thank you for your letter and cooperation on this project. If you have any questions, or I can be of any assistance, please contact me at (904)487-4469 or the letterhead address, Mail Station 300.

Sincerely,

Kirby B. Green, III, Director
Division of Beaches and Shores
by Andrew S. Grayson

cc: John Abendroth
Michael Sole
Karyn Erickson (Applied Technology and Management, Inc.)
Donald Holloman, (County Engineer, Martin County)

April ~~1~~ 20, 1994

Planning Division
Environmental Branch

Mr. Kirby Green
Florida Department of
Environmental Protection
Division of Beaches and Shores
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-2400

Dear Mr. Green:

On January 25, 1994, John Abendroff and Michael W. Sole of the DEP met with Robert J. Brock of my staff to discuss the Draft Environmental Assessment (DEA) of the Martin County Shore Protection Project. We were pleased that the meeting produced a productive and open exchange of ideas between biologists and a greater understanding of the information that was contained in the DEA. According to our notes of the meeting, several points were discussed and conclusions formulated. We have enclosed a list of those items for your review.

In order to ensure accuracy of what was discussed and concluded, we request a letter of concurrence from your office indicating that our recollection of the meeting is accurate. Please feel free to enclose any comments that you may have concerning the environmental discussions.

We thank you for your time and we look forward to working with your office to successfully implement the Martin County Project.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

Copy furnished:

Michael Sole, Florida Department of Environmental Protection
John Abendroff, Florida Department of Environmental Protection
Donald Holloman, County Engineer, County of Martin
Karyn Erickson, Applied Technology and Management, Inc.

ENVIRONMENTAL DISCUSSIONS/AGREEMENTS
MARTIN COUNTY SHORE PROTECTION PROJECT
HUTCHINSON ISLAND, MARTIN COUNTY, FLORIDA

1. The equilibrium toe line (line of closure) as estimated by the Corps must be considered accurate at this time.

2. The Corps will taper the beach fill between DEP monuments R-21 to R-23. No beach fill will be placed south of R-23.

3. A protective dune will be constructed between DEP monuments R-1 and R-23.

4. Standard precautions described in Section 9.00 of the DEA will be implemented to protect the West Indian manatee (*Trichechus manatus*).

5. Only low (< 10%) silt, beach compatible sand will be placed on the project beach.

6. Aerial photographs of the nearshore habitat along the project beach will be taken just before the project commences and annually (same time of year) for three (3) years after the project is completed.

7. It is currently estimated that no direct impacts (burial) of nearshore hardbottom habitat will occur. Therefore, no advance mitigation of hardbottoms is appropriate at this time.

8. There may be secondary impacts from increased sedimentation and turdidity to hardbottom areas seaward of the project beach as well as south towards the St. Lucie Inlet. To describe and quantify what secondary impacts, if any, occur to hardbottom habitat as a result of this beach nourishment project, a thorough multi-year (3 years) monitoring plan will be undertaken.

9. Monitoring data will be evaluated by an interagency (Corps, NMFS, FWS, DEP, County) team of scientists on an annual basis. These meetings will determine if and how much hardbottom habitat has been impacted due to the beach nourishment project. This annual meeting will also determine if further monitoring is justified and appropriate and if any modifications to the monitoring plan (contract) needs to be implemented.

10. The timing of the biological monitoring activities should be closely associated with post-project beach profile surveys.

11. If any future mitigation is appropriate, the mitigated material should closely resemble (relief, configuration, location) that of the impacted habitat.

ENCLOSURE

12. Salt-tolerant vegetation should be a component of the sand dune restoration portion of the project.

13. A nutrient "jump start" for the salt tolerant vegetation in the form of compost is acceptable provided the compost is not spread over the entire area.

14. A rope fence will be constructed to keep the public away from the newly planted dune vegetation.

15. All dredging and beach nourishment activities must be undertaken between November 1st and April 15th, only.

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

December 10, 1992

Environmental Branch
Planning Division

TO ADDRESSES ON THE ATTACHED LIST:

It is the intent of the Jacksonville District, U.S. Army Corps of Engineers, to prepare a General Design Memorandum (GDM) for construction of a 4-mile section of Hutchinson Island. The development of the Martin County Shore Protection Project is in response to a resolution adopted May 18, 1973 by the Committee on Public Works of the U.S. Senate. This particular project was authorized in the Water Resources Development Act of 1990. A brief description of the project is attached.

An Environmental Assessment (EA) is currently being prepared to provide updated environmental information on the project since completion of the revised Feasibility Report and Environmental Impact Statement (EIS) was published in June 1986. The EA will incorporate environmental information obtained from a study of the proposed project area that was undertaken in the summer and fall of 1990.

Please assist the Corps of Engineers in planning and evaluating the environmental impacts of the proposed project. We welcome your views, comments and information about resources, study objectives and important features within the described study area, as well as suggested improvements. Letters of comment or inquiry should be directed within thirty (30) days of the date of this letter to the letterhead address, attention of Planning Division, Environmental Coordination Section.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, Florida 33702

January 7, 1993

Mr. A. J. Salem
Chief, Planning Division
Department of the Army, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

This is in response to your December 10, 1992 request for comments regarding the Martin County Shore Protection Project. The project involves renourishment of approximately 4.0 miles of beach adjacent to the Atlantic Ocean along Hutchinson Island in Martin County, Florida.

The Habitat Conservation Division has no comment to provide regarding the proposed project as it pertains to impacts on fishery habitats. However, issues regarding endangered species for which the National Marine Fisheries Service is responsible are addressed by our Protected Species Management Branch at the letterhead address above. If we can be of further assistance, please contact Mr. David N. Dale of our Panama City Branch Office at 904/234-5061.

Sincerely,

Edwin J. Heppner

for Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division

cc:
F/SEO2

November 3, 1992

Planning Division
Environmental Branch

Mr. Charles A. Oravetz, Chief
Protected Species Management Branch
National Marine Fisheries Service
9450 Koger Boulevard
St. Petersburg, Florida 33702

Dear Mr. Oravetz:

Pursuant to the Endangered Species Act, as amended, the Corps of Engineers, Jacksonville District is requesting a list of any species or their critical habitat either listed or proposed for listing that may be present in the study area (see enclosed map) ~~for the~~ for the shore protection project at Hutchinson Island, Martin County, Florida. Previous consultation under the Act was initiated with your office on April 4, 1985.

The point of contact for this project is Robert J. Brock at 904-232-2389.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Region
9450 Koger Boulevard
St. Petersburg, FL 33702

November 16, 1992 F/SE013:TLD

Mr. A. J. Salem
Chief, Planning Division
U.S. Dept. of the Army
Jacksonville District, COE
Post Office Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Salem:

This responds to your letter of November 3, 1992, requesting information on endangered and threatened species under the jurisdiction of the National Marine Fisheries Service (NMFS) which might occur in the vicinity of the proposed shore protection project at Hutchinson Island, Martin County, Florida. The enclosed list contains species under NMFS purview that may occur in the marine environment off the Florida coast. No critical habitat for species under NMFS jurisdiction has been designated in that area, nor has critical habitat been proposed.

If you have any questions, please contact Terry Henwood, Fishery Biologist, at 813/893-3366.

Sincerely,

for Terry Henwood
Charles A. Oravetz, Chief
Protected Species Management
Branch

Enclosure

August 27, 1993

Planning Division
Environmental Branch

Mr. Charles A. Oravetz, Chief
Protected Species Management Branch
National Marine Fisheries Service
9450 Koger Boulevard
St. Petersburg, Florida 33702-2496

Dear Mr. Oravetz:

The Jacksonville District, U.S. Army Corps of Engineers, is currently preparing a General Design Memorandum (GDM) for construction of the Martin County Shore Protection Project at the southern end of Hutchinson Island, Martin County, Florida. It is anticipated that approximately 942,000 cubic yards of beach compatible material obtained from an adjacent offshore borrow area will be placed along a 4 mile (6.4km) segment of eroded beach.

Pursuant to Section 7(a) of the Endangered Species Act, please find enclosed the Biological Assessment (BA) addressing the concerns of the threatened and endangered species under the purview of the National Marine Fisheries Service. The U.S. Army Corps of Engineers has determined that the proposed actions will not adversely impact any listed species under NMFS jurisdiction. We base this determination on the information presented in the enclosed BA and summarized in the environmental commitments listed in Section 6 on page 8.

We request your concurrence on the above determination. If you have any questions or need any further assistance, please contact Robert J. Brock at 904-232-2389.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, FL 33702

September 15, 1993 F/SE013:LFS

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

Dear Mr. Salem:

This responds to your August 27, 1993, letter regarding the placement of approximately 942,000 cubic yards of beach compatible material along a 4 mile (6.4km) segment of eroded beach area at the end of Hutchinson Island, Martin County, Florida. A Biological Assessment (BA) was submitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the BA and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected by the proposed action.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions please contact Terry Henwood, Fishery Biologist, at 813/893-3366.

Sincerely yours,

Terry Henwood

for Andrew J. Kemmerer
Regional Director

cc: F/SE02
F/PR2

November 3, 1992

Planning Division
Environmental Branch

Mr. David Ferrell
Field Supervisor
U.S. Fish and Wildlife Service
P.O. Box 2676
Vero Beach, Florida 32961-2676

Dear Mr. Ferrell:

Pursuant to the Endangered Species Act, as amended, the Corps of Engineers, Jacksonville District is requesting a list of any species or their critical habitat either listed or proposed for listing that may be present in the study area (see enclosed map) ~~for the~~ for the shore protection project at Hutchinson Island, Martin County, Florida. Previous consultation under the Act was initiated with your Jacksonville office on April 4, 1985 (FWS Log No. 4-1-85-135).

The point of contact for this project is Robert J. Brock at 904-232-2389.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

United States Department of the Interior
FISH AND WILDLIFE SERVICE
P.O. BOX 2676
VERO BEACH, FLORIDA 32961-2676

December 16, 1992

A.J. Salem
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Att: Planning Division

Dear Mr. Salem:

This letter responds to your November 3, 1992 letter concerning Federally- listed endangered or threatened wildlife and plants potentially present in and around the site for the shore protection project at Hutchinson Island, Martin County. Our Geographical Information System (GIS) indicates that sea turtles may nest along beaches in this area. Enclosed is a list of Federally threatened or endangered species which may be present in Martin County. This list does not include State listed species. The Florida Game and Freshwater Fish Commission should be contacted to identify State listed species potentially present at the nourishment and borrow area locations.

If you have any questions please contact Jane Tutton of my staff at 407-562-3909.

Sincerely Yours,

David L. Ferrell
Field Supervisor

enclosure

cc
FWS, Atlanta, GA

August 27, 1993

Planning Division
Environmental Branch

Mr. David L. Ferrell, Field Supervisor
U.S. Fish and Wildlife Service
P.O. Box 2676
Vero Beach, Florida 32961-2676

Dear Mr. Ferrell:

The Jacksonville District, U.S. Army Corps of Engineers (Corps), is currently preparing a General Design Memorandum (GDM) for construction of the Martin County Shore Protection Project at the southern end of Hutchinson Island, Martin County, Florida. It is anticipated that approximately 942,000 cubic yards of beach compatible material obtained from an adjacent offshore borrow area will be placed along a 4 mile (6.4km) segment of eroded beach.

Pursuant to Section 7(a) of the Endangered Species Act, please find enclosed the Biological Assessment (BA) addressing the concerns of the threatened and endangered species under the purview of the U.S. Fish and Wildlife Service. While the project is expected to commence during the winter months, it is probable that some beach construction activities will still be ongoing at the beginning of the sea turtle nesting season. Although the BA addresses the various environmental commitments required of the contractor to ensure the safety of nesting sea turtles, we realize that despite good intentions, a 100% confidence interval does not exist to guarantee no impacts will occur. Because of this, the Corps has determined that the authorized project may affect nesting sea turtles, and, therefore requests that formal consultation with the Service be initiated.

Please provide your Biological Opinion, within 90 days as specified in Section 7(b) (1) of the Endangered Species Act. If you have any questions or require additional information, please contact Robert J. Brock at 904-232-2389.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

February 2, 1993

Planning Division
Environmental Branch

Ms. Marlene Stern
Florida Department of
Environmental Regulation
Division of Water Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Ms. Stern:

In response to the environmental concerns expressed at the January 11, 1993, meeting in Tallahassee, a contract to undertake a side scan sonar survey for the proposed borrow area offshore of Hutchinson Island is currently being reviewed. We have concluded that a side scan sonar survey is not necessary for the nearshore zone seaward of the project area, as aerial photographs taken in 1990 clearly show the location of the hardbottom areas that existed at that time. These hardbottom areas have been ground-truthed by divers and the exact location of the hardbottom areas can be found in a 1991 Summary Report that was prepared by Applied Technology and Management. Furthermore, it is very difficult to interpret relief and rugosity from a sonogram.

Consequently, we will conduct an underwater study to determine the physical characteristics of the nearshore hardbottom habitat. This information will be more accurate than conventional side scan methods and will be used to produce a hardbottom monitoring and mitigation plan.

Please contact Robert J. Brock in the Environmental Branch at 904-232-2389 if additional information is desired.

Sincerely,

A. J. Salem
Chief, Planning Division

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Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

March 10, 1993

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

Dear Mr. Salem:

Martin County Shore Protection Project

In response to your letter of February 3, 1993, we would like the Corps to reconsider its position on the need for side-scan sonar for the nearshore area of the Martin County Shore Protection Project. We are encouraged that side-scan sonar will be used at the borrow area. However, this technology should also be applied to the beach restoration area. Our prior experience with the use of aerial photography to delineate hardbottom has been less than encouraging.

For projects on both the east and west coasts, our field biologists have identified significant and well colonized hardbottom features during site inspections which were not visible in aerial photographs. This has resulted in delays in the permitting process. For a project the size of that proposed in Martin County, such delays could be lengthy. We have not had this problem when hardbottom features have been mapped from side-scan sonar. In addition, we believe that side-scan sonar creates a product from which the acreage of individual hardbottom features can be more accurately measured than from aerial photographs. Finally, since side-scan sonar will be used to map hardbottom features at the borrow area, it would seem to incur minimal expense to conduct a survey of the beach area with equipment and a field crew which is already mobilized.

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Mr. A. J. Salem, Chief
March 9, 1993
Page 2

I would appreciate your serious consideration of our request and thank you for notifying us of your intentions. If you would like to discuss this issue further, please contact Marlene Stern at 904/488-0130.

Sincerely,

Janet G. Llewellyn

Janet G. Llewellyn, Chief
Bureau of Wetland Resource
Management

cc: Robert J. Brock, Corps of Engineers
Bonnie Dearborn, Martin County
Don Holloman, Martin County

33

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FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

PFN: 931280

In Reply Refer To:
Susan Hammersten
Compliance Review
Section, DHR
(904) 487-2333

May 7, 1993

Mr. A.J. Salem, Chief
Planning Division
Environmental Resources Branch
USACOE, Jacksonville District
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: Draft: A Cultural Resource Magnetometer Survey for a Proposed Borrow Area, Martin County, Florida
Wes Hall, April, 1993

Dear Mr. Salem:

In accordance with the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced report, and find it to be complete and sufficient. We note that no magnetic anomalies indicative of historic resources were located during the survey.

Therefore, on the basis of the negative findings, it is the opinion of this agency that the proposed offshore borrow areas for the Hutchinson Island Beach Renourishment project are unlikely to affect any properties listed, or eligible for listing, in the National Register. The project may proceed without further involvement with this agency.

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,

Lana A. Kammerer

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Hsh

October 14, 1993

Planning Division
Environmental Branch

Mr. David L. Ferrell
U.S. Fish and Wildlife Service
Ecological Service Division
P.O. Box 2676
Vero Beach, Florida 32961-2676

Dear Mr. Ferrell:

We have reviewed the Hutchinson Island, Martin County, Florida, *Draft Fish and Wildlife Coordination Act Report* and have several comments:

The U.S. Fish and Wildlife Service (Service) states that the incidental take of relocating sea turtles contained in the February 8, 1989, Biological Opinion has been changed and that the Martin County Project should be constructed outside of the sea turtle nesting season (approximately March 1 - November 30) in this area of Florida. Although we are well aware of the importance of Hutchinson Island to nesting sea turtles, we feel prohibiting any dredging and beach disposal during the months of March and April is not scientifically justified by current nesting data for the area.

For the southern portion of Hutchinson Island from the St. Lucie/Martin County line south to the St. Lucie Inlet, sea turtle nesting data supplied by Applied Biology, Inc. shows that between 1985-1990 (6 years), the cumulative total of sea turtle nests for this approximate 7 mile (11.2km) stretch of beach during the month of March is two (Tables 1-3). This means that there is only a 33% probability that even one nest will be found in any given year during the month of March anywhere within the entire Martin County portion of Hutchinson Island. It is important to note that the project is contained within the northern 4 mile (6.4km) portion of this stretch (Figure 1). Even if one nest is found during the month of March, we do not know from the nesting data that is available to this office if that nest is even within the boundaries of the project area as approximately 38% of the nests laid in the Martin County portion of Hutchinson Island are outside the project area (Tables 4-6). Similarly, there have been 35 nests recorded for the entire Martin County portion of Hutchinson Island between the county line and the St. Lucie Inlet during the month of April during the six year period 1985-1990 for an average of 5.8 nests per year (Tables 1-3). Although we certainly agree that Hutchinson Island is a "high density" nesting area, we don't feel that it is particularly unique during the months of March and April as only 0.003% of the overall total of 12,760 nests were successfully laid during these two months.

Because of the importance of this area for nesting sea turtles, the U.S. Army Corps of Engineers (Corps) commits to doing everything possible to construct the project beach during the winter months. Currently, it is anticipated that the earliest dredging and beach construction can take place will be December 1994. Under favorable weather conditions, it is estimated that it will take approximately 4 months to complete the Martin County project (through the month of March). Based on available scientific data and allowing for some unforseen weather delays, dredging and placing beach fill on the beach during the months of March and April (at least the first half) is not an unreasonable request. Nourishment activities during the months of March and April are essential if successful completion of the project is to occur in the current expedited time frame.

Currently, the Corps is redesigning the beach fill for the southern 2,000 feet (606m) of the authorized project to significantly reduce the estimated environmental impact to these hardbottom areas. It is noted that the habitat between R-23 and R-25 has abundant marine life and high biodiversity. However, this area is not a "representative" sample of the hardbottom habitat seaward of the project beach. A large undetermined amount of hardbottom areas along the project area are ephemeral and lacks any encrusting or sessile organisms due presumably from sand scouring and periodic burial. This should be noted in the Final CAR.

We request that the Final CAR take into account the above cited information. In a letter dated August 23, 1993, we reinitiated consultation under Section 7 as requested in your Draft CAR. Based on information provided here and in our Biological Assessment, the Corps requests that the conditions prohibiting construction during the sea turtle nesting season from March 1 - November 30 be revised to May 1 - November 30. The technical study manager in the Environmental Branch is Robert J. Brock.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

SUMMARY OF SEA TURTLE NESTING DATA (1985-1990)
ST. LUCIE/MARTIN COUNTY LINE TO ST. LUCIE INLET
HUTCHINSON ISLAND, MARTIN COUNTY, FLORIDA

- there was a cumulative total of 25 loggerhead (*Caretta caretta*), 0 green (*Chelonia mydas*), and 12 leatherback (*Dermochelys coriacea*) sea turtle nests laid from the St. Lucie/Martin County line to the St. Lucie Inlet during the 6 year period 1985-1990 for the entire Martin County portion of Hutchinson Island. Of that, a cumulative total of 2 nests were laid in March (average of 0.33/yr.) with the remaining 35 (average of 5.8/yr.) in April.

- the earliest nest recorded between these years was March 14 (in 1985) for the leatherback (*D. coriacea*) and April 19 (in 1990) for the loggerhead (*C. caretta*).

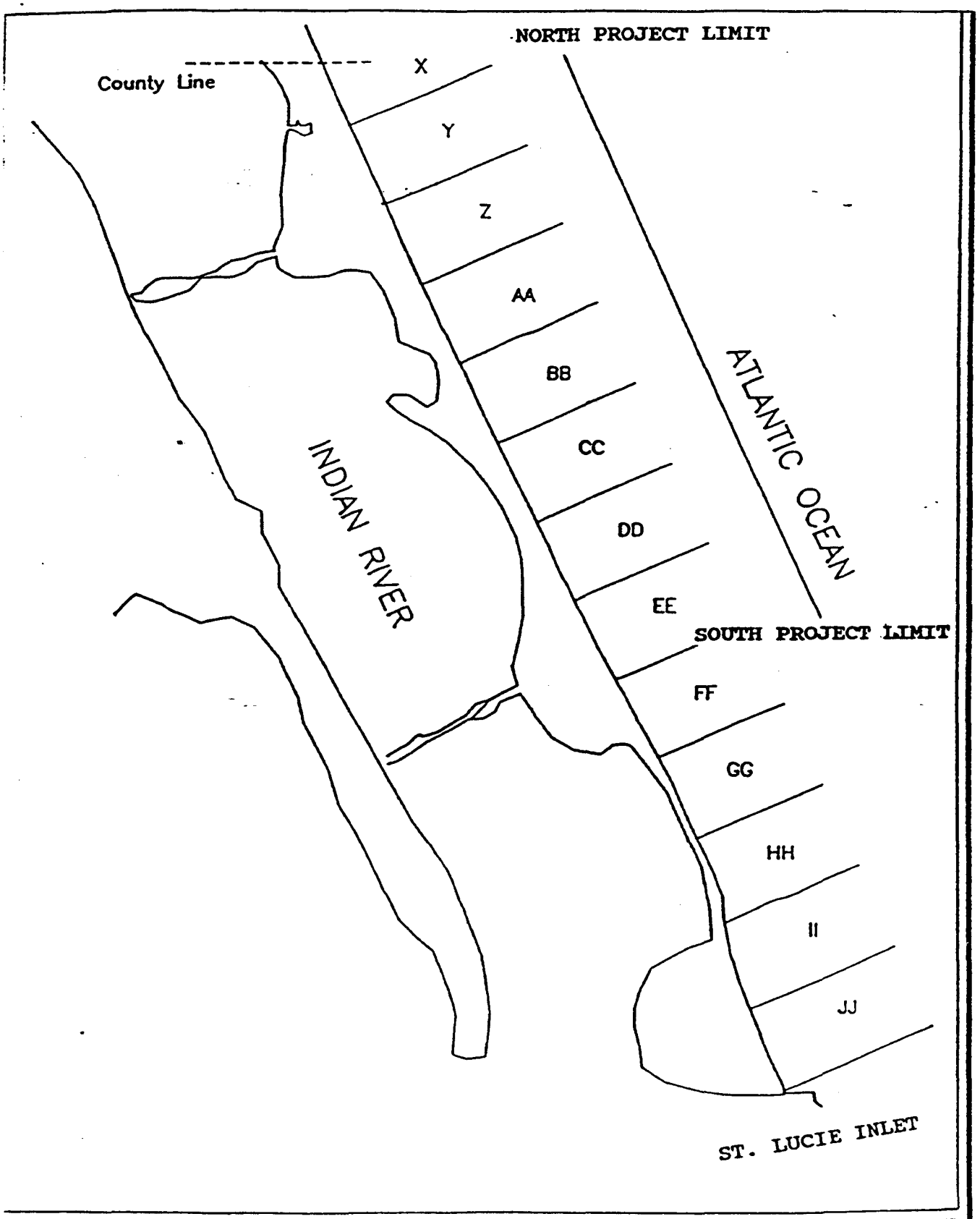

Figure 1. GENERAL LOCATION MAP OF THE SEA TURTLE MONITORING ZONES ON HUTCHINSON ISLAND

Applied Technology and Management, Inc.

IX. SUMMARY

The Corps of Engineers (Corps) has requested a Fish and Wildlife Coordination Act Report from the U.S. Fish and Wildlife Service (Service) regarding the environmental impacts of a proposed beach nourishment project at Martin County, Florida. Sand fill for the project would be obtained from an offshore borrow area. Silt and clay content of the fill is approximately 10%. Biological surveys of the area by the Corps' contractors have shown that there are rock outcrop reefs immediately offshore of the beaches proposed for renourishment. U.S. Fish and Wildlife Service observations indicate that further quantification reef acreage through aerial photography and groundtruthing is warranted, but that there are currently approximately 13 acres of nearshore reef within the project area. Our observations also show that these reef areas currently provide habitat for a diverse community of fishes and invertebrates.

The Fish and Wildlife Service recommends that impacts to reefs at the southern end of the project be avoided. Remaining unavoidable impacts may be mitigated for with artificial reef construction if carefully designed and deployed. Careful design could reduce acreage ratio requirements for full habitat value replacement. The biological rational supporting this mitigation recommendation is provided in the report.

At least one acre of designed reef should be deployed before sandpumping begins to provide alternative habitat for motile organisms displaced by the project. A subsequent study of population densities on the pilot reef should allow the Corps to estimate the appropriate acreage of mitigation required for full habitat value replacement. The Service estimates that an ineffective design may require as much as 2 acres of mitigation per acre of natural reef lost; an effective design could reduce mitigation acreage requirements by more than half.

A prior Biological Opinion in 1989 on this project allowed for nest relocation of threatened and endangered sea turtles. To further minimize incidental take of sea turtles due to nest relocation, the Service now recommends that beach nourishment activities occur between November 1 and April 15, provided the beaches are surveyed for unhatched nests prior to beach fill deposit.

5.

FLA. COAST. MGMT. TEL:904-487-2899 Mar 10 94 15:29 No.012 P.02

STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES
Governor

LINDA LOOMIS SHELLEY
Secretary

March 9, 1994

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

RE: Beach Erosion Control Projects - Draft Environmental Assessment - Martin County Shore Protection Project - Hutchinson Island, Martin County, Florida
SAI: FL9401051562C

Dear Mr. Salem:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 93-194, 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 State of Florida has completed its review of the federal consistency determination provided for the above-referenced project. Based on the information available at this time and the enclosed comments provided by our reviewing agencies, the state agrees that at this stage, the project is consistent with the Florida Coastal Management Program. However, our reviewing agencies have identified certain issues, as enclosed, which should be addressed by the applicant prior to any subsequent review of this project. Pursuant to 15 CFR 930.34 and 930.37, the applicant is required to prepare a consistency determination at each major decision point in the project for the state's

review. The state's continued agreement with the project will be based, in part, on the adequate resolution of the concerns identified in all previous reviews of the project.

Very truly yours,

Mary Anne McMullen

for Linda Loomis Shelley
Secretary

LLS/jr

Enclosures

cc: Susan Goggin, Department of Environmental Protection
George Percy, Department of State

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

JAN 21 1994

Colonel Terrance R. Salt
District Engineer, Jacksonville
P.O. Box 4970
Jacksonville, FL 32232

Attn: Mr. A. J. Salem

Subject: Environmental Assessment (EA) for Martin County Shore Protection Project, Hutchinson Island, Martin County, FL

Dear Colonel Salt:

Pursuant to Section 309 of the Clean Air Act, EPA, Region IV has reviewed the subject document which describes the environmental consequences of placing approximately 1.0 M cubic yards along a 4 mile reach which encompasses Jensen and Stuart Public Beaches. An offshore borrow area located approximately 3000 feet from the beach will provide the necessary fill material. On the basis of two visual inspections of this area there does not appear to be significant coverage by hardbottom habitat although various invertebrate communities are present.

The project has been modified to reduce the primary impacts to nearshore hardbottom habitat at its southern terminus by tapering the beach fill. Nonetheless, some hardbottom habitat will be immediately inundated by the proposed fill and require mitigation. Further, the amount of sand which is being continually resuspended in the water column by wave action will be augmented by this fill material. Hence, it is reasonable to expect that burial of low relief coquina limestone rock, scouring of encrusting and sessile organism, and episodes of increased turbidity will all increase in frequency from the current levels. Ascertaining the effects of this additional material in the intertidal and nearshore zone would be very difficult and its importance has been called into question. (6)

However, we do believe that some significant offshore/downdrift rock habitats could be adversely affected by this increased sand moving off the nourished beach. This additional material could result in adverse secondary impacts at all trophic levels since the fill effectively occurs in an instantaneous fashion while achieving equilibrium requires time. This lapse and its consequences will need to be monitored/evaluated for importance during the mitigation determination for both the offshore and downdrift rock habitats. If the monitoring results ascertain that these habitats are, in fact, adversely affected, additional mitigation will be necessary. (7)

Thank you for the opportunity to comment. If we can be of further assistance in this matter, Dr. Gerald Miller (404-347-3776) will serve as initial point of contact.

Sincerely,

Heinz Mueller

Heinz J. Mueller, Chief
Environmental Policy Section
Federal Activities Branch

Response to the USACOE Draft Environmental Assessment
for
Martin County Shore Protection Project
Hutchinson Island, Martin County, Florida

This is written to support the position of the USACOE that construction should be allowed during the November 30 through May 1 (letter from A. J. Salem to Mr. David L. Ferrell, dated October 14, 1993).

In addition to the rational as outlined in the above letter, the USFWS should take into consideration the position statements made by Interior Secretary Bruce Babbitt (Cedar-Southworth, 1993). Secretary Babbitt stated "I want very much to bring the Agencies of the Department together in a process in which we can make decisions by agreement that are for the common good. We ought to be able to formulate a common view -- It's not how many acres for the Agency -- it's how do we do this in the public interest."

The common good, in this case, is to have suitable nesting beaches for sea turtles and, at the same time provide the public with increased beach use area that also protects upland property, both private and public, from erosion damage.

There is evidence that nest relocation is a viable method of protection sea turtle nests from harm (Wyneken, et al, 1988). The success of beach nourishment during sea turtle nesting seasons while using nest relocation has been well documented by projects within the Town of Jupiter Island (e.g,Anon.,1991).

While concern has been expressed about skewed sex ratios occurring in relocated nests, highly skewed sex ratios can occur in nature (Mrosovsky and Provancha, 1988). Sex ratios of oceanic sea turtle populations are not easily studied and it is unknown of whether or not something approaching a 1 to 1 ratio exists. In any case, the total number of nests needing relocation during this project, even if extended through May, would represent such a very small percentage of Florida's nesting population that it would not adversely impact sex ratios in the wild.

As discussed in the DEA, the nests that would need to be relocated during nourishment extending into mid-April would be very low. Movement of this small number of nests will not threaten the species' with extinction.

Additionally, if nourishment were to be done on this section of Hutchinson Island through the month of May, limited numbers of nests should require relocation. A four month project starting in December should provide significant amounts of nearly completed beach by May, where nests could be left in situ.

References

Anon. 1992. Jupiter island beach restoration project 1991. Project Completion Report, April 1992: i-ii + 1-54. Gahagan & Bryant Associates.

Cedar-Southworth, D. 1993. MMS welcomes new Interior Secretary Bruce Babbitt. Today USFWS/MMS, 2(3):1-4.

Mrosovsky, N. and J. Provancha. 1988. Sex ratios of loggerhead sea turtles hatching on a Florida beach. Can. J. Zool., 67(10):2533-2539.

Wyneken, J., T. J. Burke, M. Salmon, and D. K. Pedersen. 1988. Egg failure in natural and relocated sea turtle nests. Journal of Herpetology, 22(1):88-96.

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, Florida 33702

February 7, 1994

Colonel Terrence C. Salt
District Engineer, Jacksonville District
Department of the Army, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Salt:

The National Marine Fisheries Service (NMFS) has reviewed the Draft Environmental Assessment (DEA) for the Martin County Shore Protection Project at Hutchinson Island, Martin County, Florida. The draft is dated December 1993.

The DEA adequately addresses potential project impacts to marine fisheries resources for which the NMFS has stewardship responsibility. We support the decision to shorten the length of the project to significantly reduce direct impacts to hard bottom habitat. We also concur that 1:1 mitigation in the form of artificial reef construction would adequately compensate for the anticipated direct impacts to 0.5 acre of hardbottom habitat, provided the artificial structures are designed with sufficient surface irregularity and relief. Such structures should be installed prior to initiating the shore protection project to provide a retreat for motile organisms in the project area.

Thank you for the opportunity to review this DEA. Please continue to apprise us as project plans progress. We would also appreciate receiving copies of monitoring results in the event the project is implemented. If we can provide further assistance, please contact Ms. Shelley Du Puy of our Miami Field Office at 305/595-8352.

Sincerely,

Edwin J. Koppner

for Andreas Mager, Jr.
Assistant Regional Director
Habitat Conservation Division

FLA. COAST. MGMT. TEL:904-487-2899 Mar 10 94 15:30 No.012 P.04

Florida Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

7 March 1994

RECEIVED
MAR 9 1994
Florida Coastal Management Program

Suzanne Traub-Metlay
State Clearinghouse
Office of Planning and Budgeting
Executive Office of the Governor
The Capitol
Tallahassee, Florida 32399-0001

RE: U.S. Corps of Engineers/Draft Environmental Assessment for the Martin County Shore Protection Project, Hutchinson Island
SAI: FL9401051562C

Dear Ms. Traub-Metlay:

The Department has reviewed the Draft Environmental Assessment (DEA) for the Martin County Shore Protection Project. The proposed project involves the placement of approximately 1,000,000 cubic yards of beach-compatible material along a 4.2 mile stretch of Hutchinson Island.

The Department's Division of Wetland Resource Management has very recently received a Completeness Summary Response regarding Martin County's permit application for this project (permit #432336109). This response is currently under review by wetland resource staff. In addition, the Division of Beaches and Shores has received a letter from Martin County requesting a coastal construction permit. Division staff have responded that Martin County must submit a formal application for a coastal construction permit.

9 At this time, the Department has no objections to the project as proposed. However, the specific details of the project, including the monitoring and mitigation plans, will be addressed during the permitting process.

The Department's permitting review will serve as the state's final federal consistency review for purposes of compliance with the Coastal Zone Management Act. Any questions regarding permit status should be addressed to John Abendroth at (904)488-0130 and Mike Sole at (904)487-1262.

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FLA. COAST. MGMT. TEL:904-487-2899 Mar 10 94 15:30 No.012 P.05

FLORIDA DEPARTMENT OF STATE
Jim Smith
Secretary of State
DIVISION OF HISTORICAL RESOURCES
R.A. Gray Building
500 South Bronough
Tallahassee, Florida 32399-0250
Director's Office (904) 488-1480
Telecopier Number (FAX) (904) 488-3353

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JAN 25 1994
Florida Coastal Management Program

January 21, 1994

Ms. Janice L. Hatter, Director
State Clearinghouse
Executive Office of the Governor
Room 1603, The Capitol
Tallahassee, Florida 32399-0001

In Reply Refer To:
Denise M. Breit
Historic Sites Specialist
(904) 487-2333
Project File No. 940061

RE: Cultural Resource Assessment Request
SAI# FL9401051562C
Martin County Shore Protection Project - Hutchinson Island
Martin County, Florida

Dear Ms. Hatter:

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.

A review of the Florida Site File indicates that no significant archaeological or historical sites are recorded for or likely to be present within the project area. Furthermore, because of the project location and/or nature it is unlikely that any such sites will be affected. Therefore, it is the opinion of this office that the proposed project will have no effect on historic properties listed, or eligible for listing, in the National Register of Historic Places, or otherwise of historical or architectural value. The project is also consistent with the historic preservation laws of Florida's Coastal Management Program.

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,

Laura A. Kammerer

for George W. Percy, Director
Division of Historical Resources
and
State Historic Preservation Officer

GWP/Bdb
xc: Jasmine Raffington, FCMP-DCA

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

ATLANTA REGIONAL OFFICE, REGION IV
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303-3388

January 6, 1994

Mr. A. J. Salem
Chief, Planning Division
Environmental Branch
Jacksonville District Corps of Engineers
Department of the Army
P. O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

This refers to your letter dated December 29, 1993, transmitting the draft Environmental Assessement for the Martin County Shore Protection Project, Hutchinson Island, Florida.

Our review indicates there will be no significant adverse impact on any HUD programs as a result of this project.

Thank you for the opportunity to review and comment on your proposed project.

Very sincerely yours,

Warren J. Howze

Warren J. Howze
Director
Program Support Division, CPD

FLORIDA SHORE & BEACH PRESERVATION ASSOCIATION INC.

of MARTIN COUNTY: 2355 N.E. Ocean Blvd., Stuart, FL 34996

DIRECTORS: Telephone: At work At home

V ROSS WITHAM, Honorary Chairman (Mr. Turtle) 692-1469

Kay Curiel**, President (407)-287-1777 225-2218

Al Silverman*** Tax-Payers' Com. (407) 692-4229

Bob Douglass, Finance (407) 223-9122

Claire K. Atkinson, Secretary (407) 225-3825

Betty Keele, Treasure (407)- 692-2827

Bill Mathers, P.E. (407)-287-0525 287-0971

Joe Colli, Local Govt. (407) 334-0859

Bill Pullen (Holiday Inn) (407)-225-3000

Ron Jacobstein, Vice President (407) 225-2721

Linda Venisia ,Tourism Com. (407) 225-3413

Law Committee:
Pat Hart (407) 225 0641
Bob Lincoln 223-4661

FSBPA: *The First, Ecology Award 91, **Member Of The Year 89, ***Member Of The Year 91

January 12, 1994

Mr. A.J. Salem, Chief, Planning Division
U.S. Army Corp of Engineers - Jacksonville District
P.O. Box 4970
400 West Bay Street
Jacksonville, FL 32232 - 0019

Re: Draft Environmental Assessment - December 29, 1993:
Martin County Shore Protection Project
Hutcinson Island, Martin County, Florida

Dear Mr. Salem:

Thank you for including The Martin County Chapter of the Florida Shore & Beach Preservation Assn. on your list to respond with comments on the Martin County Beach Preservation Project. Our group is a dedicated advocate of the project and its sponsor, the Martin County Commission.

We are most fortunate to have Ross Whitham both as a Director and our Honoree Chairman. He is well qualified both academically and by first-hand experience with turtles, to provide supplemental environmental suggestions on the authorized project. We concur with his suggestion to provide safe and economical turtle nest relocation during the construction of the authorized project. Please see the enclosed:

Response to the USACOE Draft Environmental Assessment
for
Martin County Shore Protection Project
Hutcinson Island, Martin County, Florida

Thank you for your continued help,
Sincerely

Al Silverman, Director

c.c./C FSBPA: Ross Whitham, Kay Curiel, and FSBPA: Stan Tait

FLA. COAST. MGMT. TEL:904-487-2899 Mar 10 94 15:31 No.012 P.07

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JAN 14 1994
Florida Coastal Management Program

Date: 01/06/94
Comment Due Date: 01/20/94
SAI# FL9401051562C

STATE AGENCIES	LOCAL/OTHER	OPB POLICY UNITS
___ Agriculture	___ RPC #1	___ Criminal Justice
___ Board of Regents	___ RPC #2	___ Education
___ Commerce	___ RPC #3	___ Environment/C & ED
_X_ Community Affairs	___ RPC #4	___ General Government
___ Education	___ RPC #5	___ Health & Human Srv
_X_ Environmental Reg	___ RPC #6	___ Revenue & Eco. Ana
_X_ Game & Fish Comm	___ RPC #7	___ SCH
___ Health & Rehab Srv	___ RPC #8	_X_ SCH/CON
___ Highway Safety	___ RPC #9	
___ Labor & Employmnt	___ RPC #10	
___ Law Enforcement	___ RPC #11	
_X_ Marine Fish Comm	___ NWFWMD	
___ Natural Resources	_X_ SFWMD	
_X_ State	___ SWFWMD	
_X_ Transportation	___ SJRWMD	
___ Trans Disad. Comm	___ SRWMD	
___ DER District		

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JAN 10 1994
MARINE FISHERIES COMMISSION

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.

_X_ 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.

SEE REVERSE SIDE FOR INSTRUCTIONS AND ADDRESSES FOR RETURN MAILING.

To: State Clearinghouse
Executive Office of the Governor-OPB

Florida Coastal Management Director
Department of Community Affairs

EO. 12372	Federal Consistency
[X] No Comment	[X] No Comment/Consistent
[ ] Comments Attached	[ ] Consistent/Comments Attached
[ ] Not Applicable	[ ] Inconsistent/Comments Attached
	[ ] Not Applicable

From:
Division/Bureau: MFC
Reviewer: [signature]
Date: 1/12/94

Date: 01/06/94
Comment Due Date: 01/20/94
SAI# FL9401051562C

STATE AGENCIES	LOCAL/OTHER	OPB POLICY UNITS
___ Agriculture	___ RPC #1	___ Criminal Justice
___ Board of Regents	___ RPC #2	___ Education
___ Commerce	___ RPC #3	___ Environment/C & ED
_X_ Community Affairs	___ RPC #4	___ General Government
___ Education	___ RPC #5	___ Health & Human Srv
_X_ Environmental Reg	___ RPC #6	___ Revenue & Eco. Ana
_X_ Game & Fish Comm	___ RPC #7	___ SCH
___ Health & Rehab Srv	___ RPC #8	_X_ SCH/CON
___ Highway Safety	___ RPC #9	
___ Labor & Employmnt	___ RPC #10	
___ Law Enforcement	___ RPC #11	
_X_ Marine Fish Comm	___ NWFWMD	
___ Natural Resources	_X_ SFWMD	
_X_ State	___ SWFWMD	
_X_ Transportation	___ SJRWMD	
___ Trans Disad. Comm	___ SRWMD	
___ DER District	___	
___	___	
___	___	

RECEIVED
JAN 26 1994
Florida Coastal Management Program

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.

_X_ 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 enclosure state license or permit.

SEE REVERSE SIDE FOR INSTRUCTIONS AND ADDRESSES FOR RETURN MAILING.

To: State Clearinghouse, EO 12372
Executive Office of the Governor-OPB

Florida Coastal Management Director
Department of Community Affairs

From:
Division/Bureau: FDOT - DIST 4 PLAN
Reviewer: [illegible]
Date: 1/20/94

	Federal Consistency
[✓] No Comment	[✓] No Comment/Consistent
[ ] Comments Attached	[ ] Consistent/Comments Attached
[ ] Not Applicable	[ ] Inconsistent/Comments Attached
	[ ] Not Applicable

APPENDIX 3

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FORM 3254
STATE TRANSPORTATION PLAN

INTERGOVERNMENTAL COORDINATION AND REVIEW ROUTING SHEET

DATE: 1/10/94

TO: Norm Feder, D1; Aage Schroder, D2; Marvin Stuley, D3; Joe Yeabeck, D4; Jim Kimbler, D5; Servando Parapar, D6; David Twiddy, D7; B. Ashbaker, Leroy Irwin

SAI#: FL 9401051562C

Application Transmitted: St Lucie/Martin Shore Protection

Date Response Due to the Clearinghouse: 1/28/94

Please review and comment regarding the attached application in accordance with Department Procedure 525-010-205-b. A letter of response to the Director of the Clearinghouse and this routing sheet should be completed and returned as directed in the procedure.

The following criteria, as appropriate to the project, should be used to evaluate the application and develop your comments:

- Florida Transportation Plan
- Adopted Work Program
- Transportation Improvement Plan (TIP)
- Right of Way Preservation and Advanced Acquisition
- Transit Development Program
- MPO Comprehensive Transportation Plan and 20 year Transportation Plan
- Florida Rail System Plan
- Florida Aviation System Plan
- Local Airport Master Plan
- Florida Seaport Mission Plan
- Environment Commitments
- Unified Planning Work Program
- Level of Service
- Access Management

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4th DISTRICT
Director of Planning & Programs

If comments are warranted based on other criteria, they should be included.

Work Program Item Number: VA (if applicable).

RONNICE S. VAUGHN
Central Office ICAR Coordinator - MS 728

TYPE: General Aviation Rail Seaports Environ
Transit

MOORE/IND

APPENDIX A

ENGINEERING DESIGN AND COST ESTIMATES

APPENDIX A
ENGINEERING DESIGN AND COST ESTIMATES
MARTIN COUNTY, FLORIDA
SHORE PROTECTION PROJECT
GENERAL DESIGN MEMORANDUM

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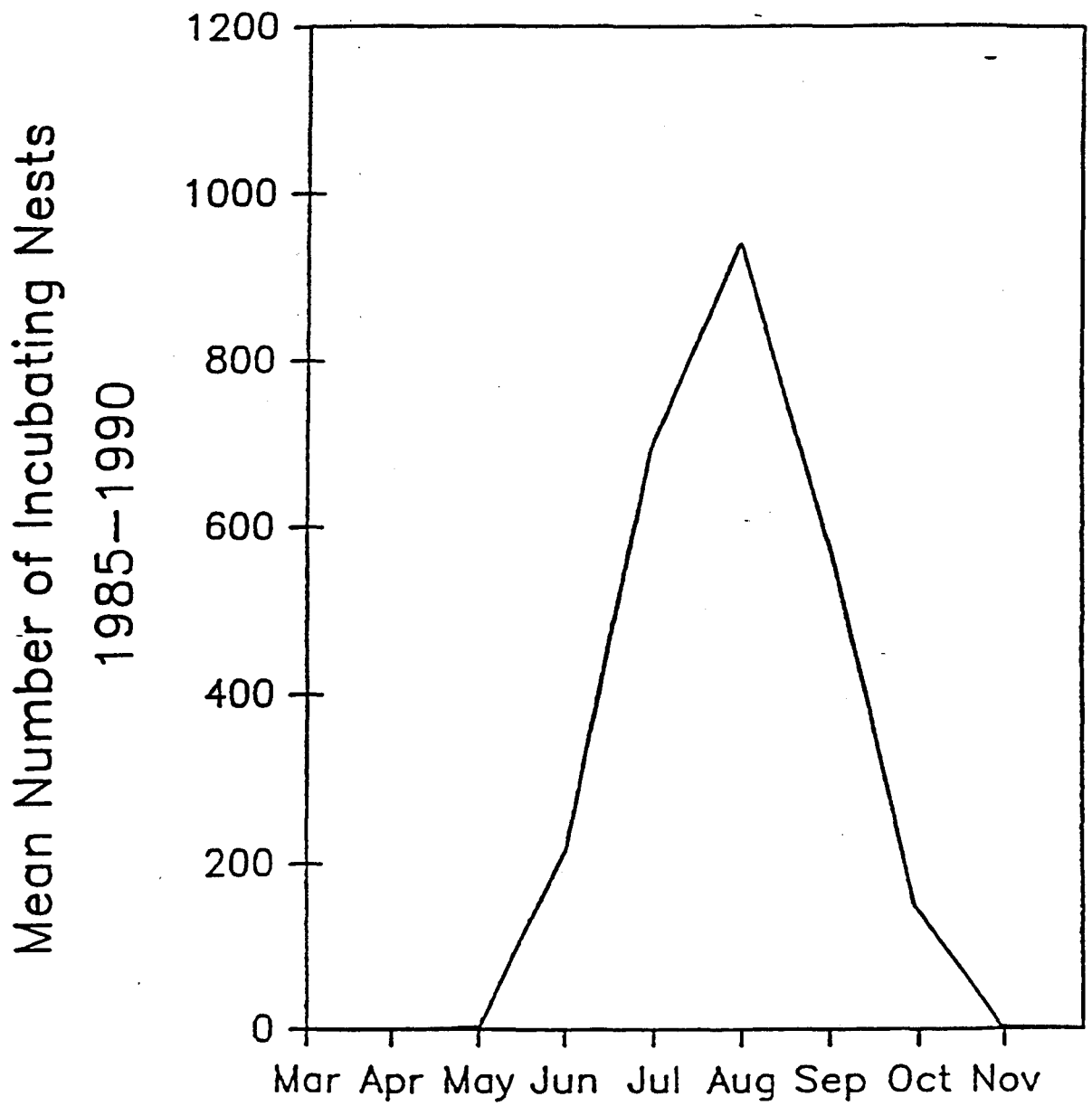

Figure 2. ESTIMATE OF MEAN NUMBER OF INCUBATING TURTLE NESTS THROUGH TIME FOR THE SOUTH HUTCHINSON ISLAND RESTORATION AREA, BASED ON 1985-1991 MONITORING DATA

Source: Mote Marine Laboratory, Inc., 1991.

Applied Technology and Management, Inc.

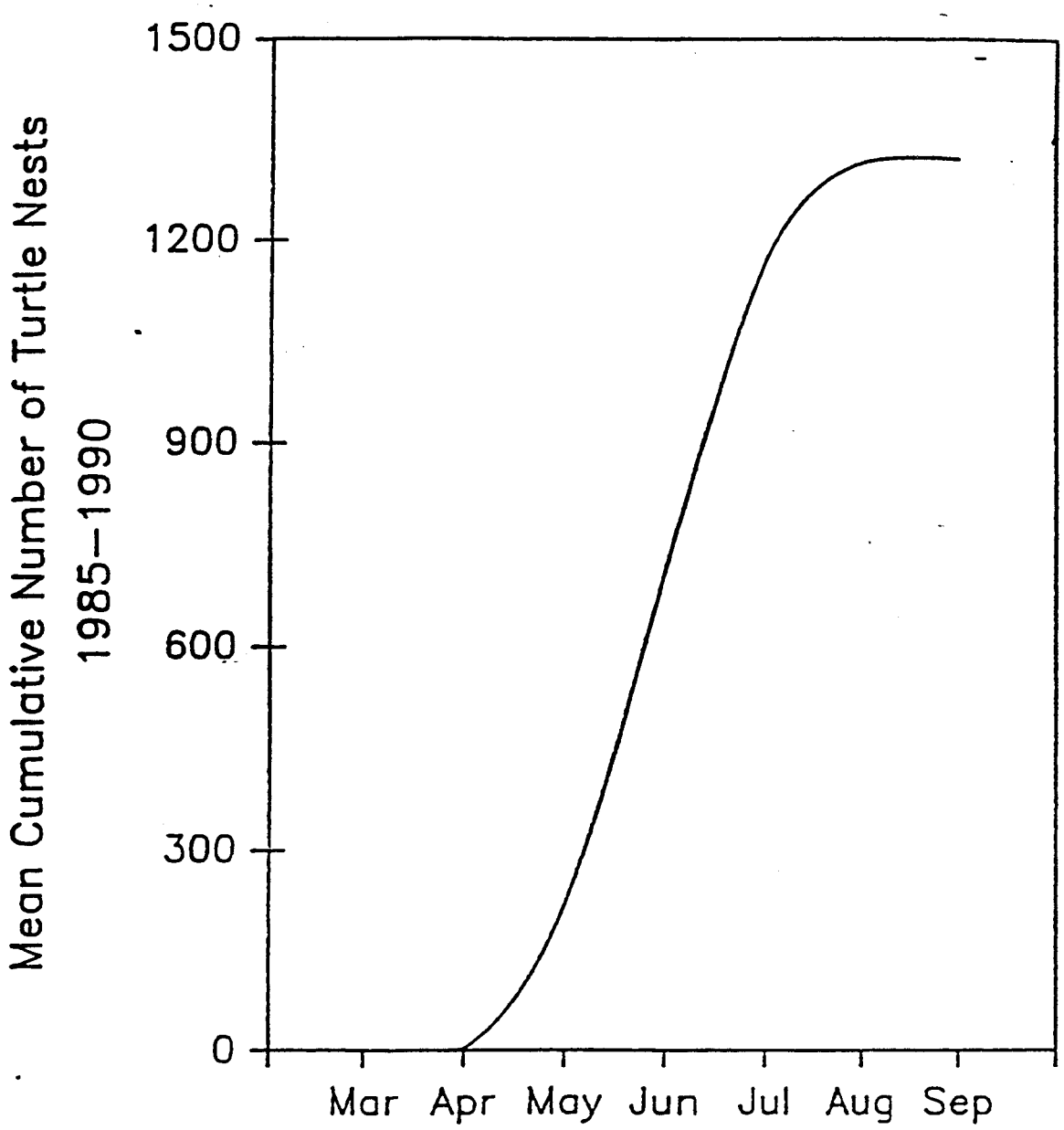

Figure 3. MEAN CUMULATIVE NUMBER OF TURTLE NESTS (FOR ALL SPECIES) FOR SOUTH HUTCHINSON ISLAND RESTORATION AREA, BASED ON 1985-1990 MONITORING YEARS

Source: Mote Marine Laboratory, Inc., 1991.

Applied Technology and Management, Inc.

Table 1. Sea Turtle Nesting Data for the Loggerhead Turtle (*Caretta caretta*) for Hutchinson Island, Martin County, Florida: Survey Areas X Thru Inlet

	MONTH							
Year	March	April	May	June	July	Aug	Sept	Total
1985	0	2	386	827	657	217	1	2090
1986	0	2	302	892	717	177	9	2099
1987	0	0	232	663	710	317	11	1933
1988	0	0	249	840	784	185	3	2061
1989	0	4	380	613	723	216	0	1936
1990	0	17	491	866	762	703	1	2340
TOTAL	0	25	2040	4701	4353	1315	25	12459
MEAN	0.0	4.2	340.0	783.5	725.5	219.2	4.2	2076.5
STD	0.00	5.90	89.36	105.87	40.34	46.18	4.26	135.83
MIN	0	0	232	613	657	177	0	1933
MAX	0	17	491	892	784	317	11	2340

Source: Applied Biology, Inc., Stuart, Florida.

Table 2. Sea Turtle Nesting Data for the Green Turtle (*Chelonia mydus*) for Hutchinson Island, Martin County, Florida: Survey Areas X Thru Inlet

	MONTH							
Year	March	April	May	June	July	Aug	Sept	Total
1985	0	0	0	7	12	11	1	31
1986	0	0	0	4	13	8	2	27
1987	0	0	0	6	16	22	4	48
1988	0	0	0	3	14	13	3	33
1989	0	0	0	8	13	12	0	33
1990	0	0	0	15	28	17	0	60
TOTAL	0	0	0	43	96	83	10	232
MEAN	0.0	0.0	0.0	7.2	16.0	13.8	1.7	38.7
STD	0.00	0.00	0.00	3.89	5.51	4.52	1.49	11.56
MIN	0	0	0	3	12	8	0	27
MAX	0	0	0	15	28	22	4	60

Source: Applied Biology, Inc., Stuart, Florida.

Table 3. Sea Turtle Nesting Data for the Leatherback Turtle (*Dermochelys coriacea*) for Hutchinson Island, Martin County, Florida: Survey Areas X Thru Inlet

	MONTH							
Year	March	April	May	June	July	Aug	Sept	Total
1985	1	1	7	4	0	0	0	13
1986	0	0	2	3	0	0	0	5
1987	0	0	6	5	1	0	0	12
1988	1	0	5	8	0	0	0	14
1989	0	6	7	2	2	0	0	17
1990	0	3	3	1	1	0	0	8
TOTAL	2	10	30	23	4	0	0	69
MEAN	0.3	1.7	5.0	3.8	0.7	0.0	0.0	11.5
STD	0.47	2.21	1.91	2.27	0.75	0.00	0.00	3.95
MIN	0	0	2	1	0	0	0	5
MAX	1	6	7	8	2	0	0	17

Source: Applied Biology, Inc., Stuart, Florida.

Table 4. Sea Turtle Nesting Data for the Loggerhead Turtle (Caretta caretta) for Hutchinson Island, Martin County, Florida: 1985-1990.

Survey Area	YEAR 1985	1986	1987	1988	1989	1990	TOTAL	MEAN	STD	MIN	MAX
X	151	131	137	140	162	177	898	149.7	15.83	131	177
Y	209	222	180	226	218	230	1285	214.2	16.64	180	230
Z	94	85	98	134	130	142	683	113.8	22.12	85	142
AA	176	202	160	157	168	183	1046	174.3	15.22	157	202
BB	139	155	126	178	177	176	951	158.5	20.32	126	178
CC	194	185	160	93	93	150	875	145.8	40.11	93	194
DD	141	179	142	165	156	185	968	161.3	16.84	141	185
EE	172	132	143	194	110	181	932	155.3	29.39	110	194
SUBTOTAL	1276	1291	1146	1287	1214	1424					
MEAN	159.5	161.38	143.25	160.88	151.75	178.00					
STD	33.9	41.61	23.18	37.80	37.22	24.68					
FF	155	147	124	150	119	132	827	137.8	13.58	119	155
GG	207	196	178	155	174	215	1125	187.5	20.56	155	215
HH	133	96	118	118	104	157	721	120.2	20.09	96	157
II	179	190	121	163	159	193	1005	167.5	24.30	121	193
JJ	127	166	232	176	152	208	1061	176.8	34.72	127	232
INLET	13	13	14	17	14	11	82	13.7	1.80	11	17
TOTAL	2090	2099	1933	2061	1936	2340	12459				
TOTAL *	2077	2086	1919	2044	1922	2329	12377				
MEAN *	159.80	160.50	147.60	157.20	147.80	179.20	952.10				
STD *	32.35	39.58	33.55	32.74	33.72	27.60	155.71				
MIN *	94	85	98	93	93	132	683				
MAX *	209	222	232	218	218	230	1285				
FIRST	APR 29	APR 29	MAY 02	MAY 04	APR 26	APR 19					
LAST	SEP 08	SEP 12	SEP 15	SEP 12	SEP 04	SEP 14					

*Excluding Inlet

Source: Applied Biology, Inc., Stuart, Florida.

Table 5. Sea Turtle Nesting Data for the Green Turtle (Chelonia mydus) for Hutchinson Island, Martin County, Florida: 1985-1990.

Survey Area	YEAR 1985	1986	1987	1988	1989	1990	TOTAL	MEAN	STD	MIN	MAX
X	1	0	3	1	1	3	9	1.5	1.12	0	3
Y	0	1	2	2	0	2	7	1.2	0.90	0	2
Z	1	0	2	0	1	2	6	1.0	0.82	0	2
AA	5	1	6	1	7	7	29	4.8	2.19	1	7
BB	10	0	11	5	6	10	45	7.5	2.99	3	11
CC	4	0	6	7	1	5	27	4.5	1.89	1	7
DD	5	0	10	4	13	9	51	8.5	3.10	4	13
EE	2	2	4	1	2	5	15	2.5	1.50	1	5
SUBTOTAL	28	22	44	21	31	43					
MEAN	3.50	2.75	5.50	2.63	3.88	5.38					
STD	3.04	3.07	3.24	2.29	4.20	2.87					
FF	0	2	0	5	2	3	12	2.0	1.73	0	5
GG	1	2	2	6	0	11	22	3.7	3.77	0	11
HH	1	1	0	0	0	2	4	0.7	0.75	0	2
II	0	0	2	0	0	0	1	0.2	0.37	0	1
JJ	1	0	1	1	0	1	4	0.7	0.47	0	1
INLET	0	0	0	0	0	0	0	0.0	0.00	0	0
TOTAL	31	27	48	33	33	60	232				
TOTAL *	31	27	48	33	33	60	232				
MEAN *	2.4	2.1	3.7	2.5	2.5	4.6	17.8				
STD *	2.79	2.62	3.45	2.41	3.73	3.45	15.46				
MIN *	0	0	0	0	0	0	1				
MAX *	10	10	11	7	13	11	51				
FIRST	MAR 14	MAY 03	MAY 03	MAR 26	MAR 30	APR 10					
LAST	JUN 29	JUN 15	JUL 20	JUN 26	JUL 17	JUL 03					

*Excluding Inlet

Source: Applied Biology, Inc., Stuart, Florida.

Table 6. Sea Turtle Nesting Data for the Leatherback Turtle (*Dermochelys coriacea*) for Hutchinson Island, Martin County, Florida: 1985-1990.

Survey Area	YEAR 1985	1986	1987	1988	1989	1990	TOTAL	MEAN	STD	MIN	MAX
X	2	0	0	1	0	1	3	0.5	0.76	0	2
Y	0	1	0	1	2	2	6	1	0.82	0	2
Z	0	0	0	1	1	0	2	0.3	0.47	0	1
AA	2	1	0	1	3	0	7	1.2	1.07	0	3
BB	1	0	3	1	2	0	7	1.2	1.07	0	3
CC	1	0	3	1	0	1	6	1	1	0	3
DD	2	0	0	3	0	2	7	1.2	1.21	0	3
EE	2	2	4	3	5	1	17	2.8	1.34	1	5
SUBTOTAL	10	4	10	11	13	7					
MEAN	1.25	0.50	1.25	1.38	1.63	0.88					
STD	0.83	0.71	1.64	0.99	1.65	0.78					
FF	1	1	1	3	1	1	8	1.3	0.75	1	3
GG	0	0	1	0	3	0	4	0.7	1.11	0	3
HH	1	0	0	0	0	0	1	0.2	0.37	0	1
II	1	0	0	0	0	0	1	0.2	0.37	0	1
JJ	0	0	0	0	0	0	0	0	0	0	0
INLET	0	0	0	0	0	0	0	0	0	0	0
TOTAL	13	5	12	14	17	8	69				
TOTAL *	13	5	12	14	17	8	69				
MEAN *	1	0.4	0.9	1.1	1.3	0.6	5.3				
STD *	0.78	0.62	1.38	1.14	1.54	0.74	4.27				
MIN *	0	0	0	0	0	0	0				
MAX *	2	2	4	3	5	2	17				
FIRST	MAR 14	MAY 03	MAY 03	MAR 26	MAR 30	APR 10					
LAST	JUN 29	JUN 15	JUL 20	JUN 26	JUL 17	JUL 03					

*Excluding Inlet

Source: Applied Biology, Inc., Stuart, Florida.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

December 29, 1993

Planning Division
Environmental Branch

TO ADDRESSES ON THE ENCLOSED LIST:

The Jacksonville District, U.S. Army Corps of Engineers, proposes to place approximately 1,000,000 cubic yards of beach compatible material onto an eroded beach beginning from just south of the St. Lucie County/Martin County line (monument R-2) and extending southward approximately 3.75 miles (6.00 km) to just south of Stuart Public Beach Park (monument R-22). The beach fill will be tapered between monuments R-1 and R-2 as well as R-22 and R-23. The beach compatible material will be obtained from an offshore borrow area located approximately 4,000 feet (1212 m) offshore of the southern end of the project beach and approximately 3.0 miles (4.8 km) northeast of the entrance to St. Lucie Inlet.

The attached Draft Environmental Assessment (DEA) was prepared to provide supplemental environmental information on the authorized project since the completion of the 1986 General Design Memorandum, 1991 Coastal Engineering and Environmental Studies Report, and 1993 interagency field investigations.

We welcome your views and comments about the information contained in the DEA as well as any suggested improvements. Letters of comment or inquiry should be addressed to the letterhead address to the attention of the Planning Division, Environmental Coordination Section and received by this office within forty-five (45) days of the date of this letter.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosures

Appendix G

Comments and Responses to the Draft Environmental Assessment

Martin County Shore Protection Project

Hutchinson Island, Martin County, Florida

RESPONSE TO COMMENTS

Comments were received from the U.S. Fish and Wildlife Service (via the CAR), U.S. Department of Housing and Urban Development, U.S. Environmental Protection Agency, National Marine Fisheries Service (NOAA), Florida Department of Community Affairs, Florida Department of Environmental Protection, Florida Division of Historical Resources, and Florida Shore & Beach Preservation Association of Martin County. Comments are sequentially numbered on the attached correspondences, and responses are as follows:

U.S. Fish and Wildlife Service Final Coordination Act Report dated January, 1994.

COMMENT: The nourishment area should be shortened by approximately 2500 feet at the southern end to eliminate impacts to nearshore reefs; a new set of aerial photographs of the nearshore should be taken and groundtruthed; it is estimated that approximately 13 acres of reef will be buried; an artificial reef should be designed to provide habitat for species of interest to local SCUBA divers and snorklers; and the Service recommends that beach nourishment activities occur between November 1 and April 15.

RESPONSE: Martin County (the non-Federal sponsor) and the U.S. Army Corps of Engineers (Corps) have agreed to taper the last 2,000 feet of beach fill between State monuments R-23 and R-25. This modification eliminates the need for mitigation of any direct impacts as none are now anticipated. Aerial photographs taken over time will highlight the natural variability of sand movement in this area due to naturally dynamic conditions that are present off Hutchinson Island as well as to provide assistance in assessing the movement of beach fill material. The U.S. Fish and Wildlife Service (Service) based the 13 acre adverse impact to hardbottom habitat estimate on 1990 beach surveys and estimated limits of the equilibrium toe of fill provided by Coastal Technology, Inc., in 1991. Utilizing the most recent (1992) beach surveys and computer models that estimate the seaward extent of the equilibrium toe of fill, the Corps currently estimates that there will be no direct impact to any hardbottom habitat from implementation of the modified project. If mitigation of hardbottom habitat is later found to be justified from analysis of the hardbottom monitoring data, it is Corps policy to provide like and in-kind mitigation whenever feasible. By using irregularly shaped and sized hardened material such as concrete or limestone for any possible mitigation, mitigated habitat will contain various crevices, holes, ledges, and desired interstitial spaces. The Corps commits to turtle monitoring and nest relocation, if necessary, beginning on March 1 and continuing until April 15.

U.S. Environmental Protection Agency correspondence dated January 21, 1994.

COMMENT: Some hardbottom habitat will be immediately inundated by the proposed fill and require mitigation; some significant offshore/downdrift rock habitats could be adversely affected by increased sand moving off the nourished beach and this increased material could result in adverse secondary impacts at all trophic levels.

RESPONSE: The project has been further modified so that no inundation of hardbottom habitat by beach fill is expected. Some significant offshore and downdrift rock habitats **could** be adversely affected by increased sand moving off the nourished beach. To determine what impacts, if any, moving sand has on offshore/downdrift hardbottom habitat, the Corps has proposed a thorough quantifiable multi-year monitoring study of randomly selected hardbottom habitat areas. An interagency group of scientists will review the data and will ascertain what impacts, if any, have occurred to hardbottom habitat and associated flora and fauna. If the results of the monitoring indicate that hardbottom habitat has been advesely impacted, then appropriate mitigation will be performed.

National Marine Fisheries Service (NOAA) correspondence dated February 7, 1994.

COMMENT: NOAA supports the decision to shorten the length of the project to significantly reduce direct impacts to hardbottom habitat; any appropriate mitigation in the form of artificial reefs should be constructed using a 1:1 ratio; any artificial structure should be installed prior to initiating the shore protection project to provide a retreat for motile organisms in the project area.

RESPONSE: See responses to the U.S. Fish and Wildlife Service comments.

Florida Department of Environmental Protection correspondence dated March 7, 1994.

COMMENT: The Department has no objections to the project as proposed at this time. Specific details of the project will be assessed and addressed during the permitting process.

RESPONSE: The Corps will work closely with the Florida Department of Environmental Protection during the permitting process to address the specific details of the monitoring and mitigation plans.

Some fundamental features which should be incorporated into the design are: 1) extensive unshaded horizontal surface area for the attachment and growth of gorgonians and macroalgae; 2) openings near the bottom, for Spiny lobster, depth of at least 2 ft. and height of no more than 1 ft.; 3) interstitial spaces of approximately 10 cubic ft.; 4) large overhanging ledges to provide shaded resting space for large fish; 5) numerous projections, crevices, and holes ranging in size from one to three inches in width and up to 1 foot in length (projections) and depth (holes and crevices) to provide refugia for small fish and for juvenile fishes, as well as to provide additional surface area for epibiotic growth.

Any structure intended to mitigated for the loss of limestone substrate should, likewise, be built of limestone rather than concrete. To date, no comprehensive scientific study of substrate selectivity for epibentic organisms on limestone verses other artificial reef building materials has been done. It may be that unnatural materials inhibit the settlement or growth of certain species of encrusting organisms. This could, in turn, alter the structure of the resulting associated fish community.

Limestone, however, cannot be formed into desired shapes like other material such as steel or concrete. A possible solution to the potential problems associated with substrate selectivity in fouling organisms while taking advantage of the moldability of concrete, would be to embed limestone rock in the surface of molded concrete pieces. If such pieces were to be constructed into a carefully designed artificial reef project of high relief, it may be possible to exceed the habitat values of the existing natural reef for certain species. This would reduce the acreage of mitigation needed to replace lost reef carrying capacity.

In our opinion, because of the low relief of much of the existing natural reef, a carefully planned artificial reef could reduce by as much as 50% mitigative reef acreage needed to recover impacted reef value. Final acreage calculations will have to await aerial mapping and groundtruthing of the two areas previously discussed. We would welcome the opportunity to work with Corps staff and that of Martin County in developing a suitable yet economical reef design and in monitoring the effectiveness of that design.

VIII. FISH AND WILDLIFE SERVICE RECOMMENDATIONS

The Fish and Wildlife Service recommends that the following be included in future project planning:

A. <u>Project Design</u>

1. The nourishment area should shortened by approximately 2500 feet at the southern end. This would place the southern limit of the project at R-23 or in front of the Stuart Public Beach. This modification would eliminate impacts to the nearshore reefs which extend south of R-23 and reduce mitigation needs.

front of the Stuart Public Beach. This modification would eliminate impacts to the nearshore reefs which extend south of R-23 and reduce mitigation needs. Eventually, sand would be transported by natural littoral drift to beaches further south.

B. Reef Mitigation

1. A new set of aerial photographs of the nearshore should be taken and groundtruthed. A precise measurement of the reef area which will be buried by the project should then be made. Once this is done, final mitigation acreage necessary to compensate for this burial can be calculated.

2. We estimate that approximately 13 acres of reef will be buried. We recommend that at least 1 acre of artificial reef is deployed prior to project construction. This will provide an alternative refuge for some of the fish displaced by the project. In addition, with detailed monitoring of population densities on the initial reef deployed, the carrying capacity per acre of the designed reef could be estimated and the appropriate acreage ratio required for full habitat value replacement could be determined.

3. The artificial reef structure selected for mitigation for unavoidable impacts should be designed to provide habitat for species which are of interest to local SCUBA divers and snorkelers. Its surface should consist of limestone. Design features should include: a) extensive unshaded horizontal surface area; b) openings near the bottom for Florida lobster; d) interstitial spaces approximately 10 cubic feet; e) large overhanging ledges; f) numerous projections, crevices and holes.

4. Assuming that the artificial structure is carefully designed and will have approximately twice as much surface area per acre above the scour zone as the natural reef, we tentatively recommend a mitigation ratio of no less than 0.5 to 1, pending review of the final design and monitoring of a pilot reef (see 2 above). However, an ineffective design could require more acreage than existing natural reefs buried.

5. Surveys of the area of deployment of the designed reef should be made to ensure that it is placed on a solid foundation. There may be areas low relief rock just offshore of the fill area where scouring and periodic burial have reduced reef habitat values to near zero. Such area should be located and utilized for reef placement.