CESAM-PD-EC (310-2d) June 23, 1988

MEMORANDUM FOR RECORD

Subject: Public Hearing Report: Proposed Rulemaking Hearing by the Alabama Department of Environmental Management for the Change in the Location of the Construction Control Line on Dauphin Island, Alabama.

1. The Alabama Department of Environmental Management (ADEM) held a public hearing at 7:00 p.m., on June 16, 1988, in the Dauphin Island Civic Center on Bienville Boulevard, Dauphin Island, Alabama, to receive data, views and arguments from interested persons regarding the proposed changes to the Coastal Area Management Program rules pertaining to the Dauphin Island construction control line.

2. A copy of the meeting handout is provided as Attachment 1. The handout contains a summary of reasons supporting the adoption of the proposed amendments to the coastal program regulations (Chapter 8-1) of ADEM and selected supporting documents. For your ease of reference, ADEM states that the construction control line is defined as a line running parallel to the shoreline at a point 40 linear feet inland of the crestline of the primary dune system. Construction is prohibited seaward of this line.

3. The hearing was moderately attended and approximately 8 persons delivered prepared statements. Copies of two of these statements were obtained and are provided as Attachments 2 and 3. Attachment 2 is the statement given by Mr. Gary Ellis for ADEM and Attachment 3 is the statement given by Mr. Tom Thornhill for the Department of the Interior, Fish and Wildlife Service (FWS). Attachment 4 is a copy of the construction control line maps which were prepared by Dr. George Lamb of the University of South Alabama for ADEM.

4. In general, all comments and statements favored the adoption of the proposed amendments. The FWS remains concerned regarding the status of the construction control line from the area known as West Surf Beach from Pirates Cove Street westward to the end of the pavement on Bienville Boulevard. In this area ADEM proposes to adopt a construction control line corresponding to the existing restrictions imposed by the Dauphin Island Property Owners Association. The FWS indicated, in their statement, that the proposed rule is not clear in this regard since it appears to rely on property lines without any monuments serving to delineate the control line. The FWS maintained that it will not take a position on the construction control line in this area until a monument system is established.

CESAM-PD-EC
Subject: Continuation of June 16, 1988, Public Hearing Report

5. The proposed amendments also support minor improvement of the west end of Dauphin Island to a point 2 miles west of the end of the pavement. Consideration is being given to constructing picnic tables, etc. No vehicular traffic would be allowed in this area. The area west of this picnic area to the western tip of Dauphin Island would be left to nature. Also, the area west of the picnic area is being examined for potential inclusion in the Bon Secour National Wildlife Refuge.

6. Copies of this MFR were provided to OP-O and OP-S and one copy was routed through PD-EC, PD-E, and PD-F, AND PD.

3
4 Atchs

R. Douglas Nester
Biologist, PD-EC

Atch 4 not provided.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
ENVIRONMENTAL MANAGEMENT COMMISSION
NOTICE OF RULEMAKING HEARING

Chapter No. 355-8-1
Title of Chapter: Coastal Area Management Program Rules

The Alabama Department of Environmental Management is proposing to amend ADEM Admin. Code Chapter 335-8-1, Coastal Area Management Program Rules.

This amendment is to Rule No. 8-1-.02 and 8-1-.16 which is a proposed change in the location of the construction control line on Dauphin Island.

Copies of the proposed amendment to the rules and a summary of reasons supporting their adoption are available for inspection or purchase ($1.50) at each of the following locations:

ADEM Office of General Counsel
1751 Federal Drive
Montgomery, AL 36130
(205) 271-7855

ADEM, Field Office
Unit 806, Building 8
225 Oxmoor Circle
Birmingham, AL 35209
(205) 942-6168

ADEM, Field Office
2204 Perimerter Road
Mobile, AL 36615
(205) 479-2336

ADEM, Field Office
400 Well Street, #210
Decatur, AL 35602
(205) 353-1713

A public hearing will be held at 7:00 p.m., on June 16, 1988, in the Dauphin Island Civic Center on Bienville Boulevard, Dauphin Island, Alabama, to receive data,views and arguments from interested persons regarding the proposed rules. Attendance at the hearing is not necessary to present such data, views or arguments as the same may be submitted in writing, but must be received by the Hearing Officer prior to 5:00 p.m. on June 27, 1988. Written submissions and other inquiries should be directed to: Tommy E. Bryan, Hearing Officer, Office of General Counsel, Alabama Department of Environmental Management, 1751 Federal Drive, Montgomery, Alabama 36130.

This notice is hereby the May 1, 1988 by authority of ADEM.

Leigh Pegues

LEIGH PEGUES, DIRECTOR

SUMMARY OF REASONS SUPPORTING THE ADOPTION OF PROPOSED AMENDMENTS TO THE COASTAL PROGRAM REGULATIONS (CHAPTER 8-1) OF THE ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND SELECTED SUPPORTING DOCUMENTS.

Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, Alabama 36130

SUMMARY OF REASONS SUPPORTING ADOPTION OF
PROPOSED AMENDMENTS TO CHAPTER 8-1 COASTAL AREA
MANAGEMENT PROGRAM RULES

8-1-.02 Definitions

(j) "construction control line". The proposed amendment establishes a surveyed construction control line for Dauphin Island, Mobile County, Alabama. Subparagraph 1. repeals the use of a line running parallel to the shoreline at a point 40 linear feet inland of the most inland point of the crestline as the construction control line on Dauphin Island, but continues the use of such a line within the city limits of Gulf Shores. Subparagraph 2. describes the construction control line in an area known as West Surf Beach of Dauphin Island, Mobile County, Alabama. Code of Alabama Section 9-7-20 provides that it is the intent and purpose of this section to avoid duplication whenever possible as to managing activities within the coastal area and yet assure compliance with the Alabama Coastal Area Management Program. To avoid duplication, the Department purposes to adopt existing restrictions governing construction in the area known as West Surf Beach. Subparagraph 3. describes a surveyed construction control line extending from the eastern most end of Dauphin Island. A summary of the justification for the surveyed construction control line described in subparagraph 3. is contained in Coastal Construction Control Line for Dauphin Island, Alabama appended hereto. Monuments are located at each coordinate for surveying convenience. A description of the location of each monument is appended hereto in Alabama Department

of Environmental Management Mobile County Construction Control Line Third Order Alabama West Zone Coordinates, Monuments 15 through 33 subparagraphs 4. and 5. continue the use of a surveyed construction control line in Baldwin County.

8-1-.16 Construction or Activity on Beaches and Dunes

The proposed amendment in paragraph (3) would prohibit construction of new structures on, beneath or above any lands located between the western most end of Dauphin Island and plane coordinates (x = 281,573.2 feet; and y = 90,763.33 feet) which are located 530°E approximately 320 feet from the end of the pavement on Bienville Boulevard.

COASTAL CONSTRUCTION CONTROL LINE
FOR DAUPHIN ISLAND, ALABAMA

I. INTRODUCTION

This report provides documentation for the rationale, methodology and results associated with the program under the auspices of the Alabama Department of Environmental Management to establish a Coastal Construction Control Line (CCCL) for the state of Alabama. The CCCL is intended as a line of prohibition, Gulfward of which there would be no "hard" or permanent" structures, i.e., structures requiring foundations. This report addresses only Dauphin Island, and is a follow-up and continuance of the report on the CCCL prepared by Dr. Robert G. Dean, covering the Baldwin County portion of the Alabama coastline. Since the same criteria were used in the location of the CCCL all along the coastline of Alabama, reference to that report is both useful and critical.

II. RATIONALE

The Dean report, referred to in the Introduction, points out the need for the program establishing the CCCL, and refers to similar studies in other states. As pointed out in that study, the basis for the Alabama CCCL provides solely for the long-term protection of the beach-dune system.

III. METHODOLOGY

The Dean report lists all of the variable factors which were important in establishing the Alabama CCCL in Baldwin County. These same factors are important in establishing the CCCL on Dauphin Island,

with the relative importance of the individual factors varying with the topography of the beach.

A listing of the factors considered in establishing the CCCL on Dauphin Island, and the rationale for their use is included in the Dean report. The importance of these various factors is, for the most part, self-evident. The list includes:

(1) Elevation
(2) Seasonal Variation in Shoreline Position
(3) Planform Irregularities
(4) Vegetation Line
(5) Primary Dune
(6) Past Experience During Storms
(7) Expected Erosion During Storms
(8) Alignment of Existing Structures
(9) Buildable Property
(10) Orderly Development
(11) Judgment

These eleven factors were combined into criteria leading to the recommended location of the Coastal Construction Control Line. These criteria are:

(1) Vulnerability During Storms
(2) Alignment of Existing Structures
(3) Buildable Property
(4) Maintaining Structures at Higher Elevations

Table I, from the Dean report, demonstrates the relationships between each of these four criteria and the eleven factors.

Studies of Dauphin Island were undertaken, both in the field and in the office. Field studies included establishment of the primary dune line, and measurements of the variations in the shoreline from time to time. Evidence of seasonal changes were noted, and the shoreline character, and evidence of past storms and erosion were cataloged.

TABLE I

SUMMARY OF FACTORS CONSIDERED AND THEIR RELATIONSHIP TO THE DETERMINING CRITERIA

Factors Considered	Criteria (and Related Factors)
1. Elevation	1. Vulnerability During Storms (1, 2, 3, 4, 5, 6, 7, 11)
2. Seasonal Variation in Shoreline Position	2. Alignment of Existing Structures (8, 10, 11)
3. Planform Irregularities	3. Buildable Property (8, 11)
4. Vegetation Line	4. Maintaining Structures at Higher Elevations (1, 8, 10, 11)
5. Primary Dune	
6. Past Experience During Storms	
7. Expected Erosion During Storms	
8. Alignment of Existing Structures	
9. Buildable Property	
10. Orderly Development	
11. Judgment	

Office studies were largely based on the examination of aerial photographs from various times in the past. Some charts and reports were also sued, and correlated with the data from the aerial photography. The principal, and most obvious result of these studies, is that Dauphin Island is divided into two quite different portions: the East End and the West End. The importance of the differences between these two portions cannot be too strongly emphasized. The East End has all of the higher elevations of the island, although only a small portion of it is above the 100-year flood prone areas as delineated by the Army Corps of Engineers, and shown in Figure 1. In addition to being generally higher in elevation, the East End is forested, and was an island at times in the geological past before the sand spit which is the West End was appended. Also, there is no significant construction on or near the beach in the East End portion.

Of all the factors and criteria examined in connection with the CCCL, elevation was the single most important one. If the beach goes immediately to higher elevations inland, then storm damage to the beach is minimized. In those cases where there is no high elevation to the beach, and continued low areas behind the beach, damage is at a maximum. Such is the case on the West End of Dauphin Island, west of the elevations provided by the relatively high dunes of the Dauphin Island Board property in the area of the fishing pier, and onto the leased property which was formerly the site of the Holiday Inn. These slightly higher dunes are gone completely on the Dauphin Island Board property on the curve of Bienville Boulevard, approximately at its intersection with Perdido Street.

From the above described point, on to the west, Dauphin Island has been cut in two by storms several times in the past. After the storms of the summer of 1985, there was essentially no elevation as high as five feet above sea level between the Gulf of Mexico on the south and Mississippi Sound on the north. Any

dunes that had been on the beach had been flattened, and there was no real barrier, or source of sand, other than the beach itself. Except for those areas in which seawalls have been built, the land north of Bienville Blvd. is a marsh. The 1985 summer storm damage was especially severe along this north shore of the island in many places, with beaches, piers and boathouses being washed away.

IV. RESULTS

The East End of Dauphin Island. Since there is no construction on the beach area, and the beach area is not broken into small lots, the principal criterion considered for the placement of the CCCL is, (1) Vulnerability during storms. Studies have shown that Hurricane Frederic, in 1978, initiated a cycle of erosion on much of the East End, particularly removing the sand from the stone groins on the south side of the island, removing a great deal of the beach on the Coast Guard property, and cutting into the Isle Dauphine golf course. This erosion, while severe, does not seem to be permanent, in that aerial photographs from 1940 show similar erosion, but deposition during the 1950s and 1960s essentially covered the groins with sand, and built a beach straight westward from the westernmost. And while erosion has affected much of the beach since Frederic, there are areas where deposition has taken place. The erosion, however, is a factor in setting the CCCL well back from the beach, to higher elevation. The severe erosion around the area of the public beach and fishing pier prompted the setting of the CCCL back into the large, eroded dunes. Certainly there is nothing that could still be called a primary dune remaining in the area.

The West End of Dauphin Island. The West End of Dauphin Island, i.e. west of the Dauphin Island Board property on the curve in Bienville Boulevard, approximately at its intersection with Perdido Street, is a much more fragile environment. The low elevation of the beach, and all across the width of the island, make it more

susceptible to storm damage. This was clearly seen after the summer storms of 1985. The erosion cycle that has affected the East End has also affected the West End, but to a lesser degree. Some of the houses are clearly built too close to the water, and have had an adverse effect on the normal beach processes. If erosion continues, this will become more pronounced.

In delineating the CCCL, all of the factors had to be considered. However, variations in elevation, vegetation line and position of the primary dune show little or no variation on the West End. Certainly, all of the criteria were used in the placement of the CCCL, with special notice being taken of the principal alignment of existing structures, and buildable property. In some cases, houses have been built forward of a generally well-established line of existing structures, and encroach on the beach. Further erosion can make some of the now buildable property untenable, and encroachment of buildings onto the beach can only speed this event.

An effort was made to keep the CCCL essentially parallel to the average shoreline since most of the physical characteristics of the beach change little. Adjustments of the line were made to take into account the criteria which were most appropriate at that location.

There has already been about as much development as this fragile environment can tolerate. The seeming reluctance of many property owners to repair or rebuild after the summer of 1985 indicates an awareness of the extreme vulnerability of the already developed portion of the West End of Dauphin Island, and development even further to the west should be limited to non-permanent structures.

REFERENCES

Dean, Robert G., 1984, Location of the Coastal Construction Control Line, Balwin County, Alabama, ADEM

South AlabamaRegional Planning Commission, 1979, Acquistion and Development Strategy for the West End of Dauphin Island

U.S. Army Corps of Engineers, 1981, Hurricane Frederic - Post Disaster Report, 30 August - 14 September, 1979.

COASTAL CONSTRUCTION CONTROL LINE
FOR BALDWIN COUNTY, ALABAMA
(Documentation of Rationale, Methodology and Results)

March 23, 1985

Prepared For:

Alabama Department of Environmental Management
State Capitol
Montgomery, AL 36130

Prepared By:

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3218 N.W. 31st Street
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COASTAL CONSTRUCTION CONTROL LINE FOR BALDWIN COUNTY, ALABAMA
(Documentation of Rationale, Methodology and Results)

I. INTRODUCTION

This brief report provides documentation for the rationale, methodology and results associated with the program under the auspices of the Alabama Department of Environmental Management to establish a Coastal Construction Control Line (CCCL) for Alabama. The CCCL is intended as a line of prohibition, Gulfward of which there would be no "hard" or "permanent" structures, i.e., structures requiring foundations. This report addresses only the Baldwin County portion of the Alabama Shoreline, which is considered to be the more critical area. Effective regulations have been adopted locally on Dauphin Island.

II. RATIONALE

In recognition of the vulnerability of the coastal zone to imprudent construction and the associated potential long-term adverse impacts on the beach and dune system, a number of coastal states (Florida, Texas, North Carolina and California) have or are now developing programs to regulate coastal construction. In developing and applying the rationale for the Alabama Coastal Construction Control Line, the various elements of programs from other states were considered and, where deemed appropriate, were included. However, the basis for the Alabama CCCL provides solely for the long-term protection of the beach dune system.

III. METHODOLOGY

Factors Considered in Establishing the Coastal Construction Control Line

A number of factors have been considered in the establishment of the CCCL. Each of the major factors will be described and discussed in later sections. In broad general terms, these factors include geology, coastal engineering aspects, storm vulnerability, past local construction practices, etc. These factors have been developed into criteria on which the recommended line position is based in an attempt to provide the optimum long-term preservation of the beach and dune system and to maintain the high-quality natural characteristics of the shoreline.

The following paragraphs describe each of the factors considered and present briefly the rationale and role that it played in the recommended location of the CCCL.

Elevation - The natural elevation of the shoreline relates to the vulnerability to storms. Generally, the lower the beach profile, the greater the vulnerability to landward penetration of the storm effects (tides, currents and waves) and the greater the potential for beach and dune profile modification by storms. If the peak elevations of a barrier island are subject to overtopping by storms, sediment may be carried landward by overtopping waves and currents, resulting in additional erosion potential and the possibility for inlet formation.

Seasonal Variation in Shoreline Position - Along most of the sandy shorelines in the United States the wave characteristics are such that sand is transported offshore during the stormy winter months and onshore during the milder summer months. With the added complexity of hurricanes during

the summer months, this seasonal variation with wider beaches during the summer months applies to the Alabama shoreline. Although a detailed quantification of the seasonal swings along the Alabama shoreline has not been established, it appears that this variation is on the order of 80 to 100 ft. Obviously, the control line should be located substantially landward of the seasonal envelope of the shoreline positions.

Planform Irregularities - Portions of the Alabama shoreline are subject to the formation of fairly large-scale planform irregularities. In plan view, these features are composed of cusps or points protruding into the Gulf separated by bays (erosional features). The planform relief of these features may be substantial. On October 5, 1984, just west of Perdido Pass, the distance from a cusp point to a line joining the shoreline of the two adjacent bays was 175 ft. This feature may have been affected by the proximity of Perdido Pass. The relief of a similar feature approximately 1.5 miles to the east of Perdido Pass was on the order of 50 ft.

Vegetation Line - The beach and dune grass vegetation line is a relatively short term (1-2 years) indicator of recent shoreline variations. Brush and trees are indicators of portions of the beach where both growth conditions and longer-term shoreline stability have allowed these plants to develop.

Primary Dune - The primary dune line was the earliest basis for regulating coastal construction in Alabama. The primary dune line provides an indication of relatively short-term shoreline conditions. Storms may completely remove a primary dune and with the return of long periods of mild wave activity, the primary dune will form sufficiently far from the shoreline such that salinity and other growth conditions are met. In most

cases, beach and dune grasses are the stabilizing agent for primary dunes. As the shoreline continues to recover, additional primary dunes may form farther Gulfward.

Past Experience During Storms - Past local experience during storms is important as it provides actual documentation of the shoreline response during a particular event. Hurricane Frederic made landfall near the center of Dauphin Island on September 13, 1979, causing peak storm tides ranging from 9 to 15 ft along the entire Alabama Gulf of Mexico shoreline. In terms of available aerial photographs, post-storm tide levels and structural damage surveys, this is probably the best documented hurricane on record. Available information on Hurricane Frederic was incorporated into an excellent report by the Mobile District of the U.S. Army Corps of Engineers (U.S. Army Corps of Engineers, 1981).

Expected Erosion During Storms - The expected erosion during an extreme storm is an important parameter in locating the coastal construction control line. At present (1984), reasonably good predictive techniques (computer models) exist to estimate the limits of expected erosion due to a particular hurricane event.

Alignment of Existing Structures - A densely-developed area may have so altered or even eliminated the natural beach/dune system that it is not rational to attempt to relocate the construction line. In these cases, if an existing line of structures is established and reasonably well aligned, it may be considered appropriate to maintain that line of construction on new buildings. To some degree, these areas of dense development, by accomodating more people visiting the beach per unit area, relieve the

pressure on the more pristine shoreline segments, thereby contributing to the location of a CCCL which is more consistent with the preservation of the overall natural beach/dune system.

Buildable Property - In some cases, small changes were made in the location of the CCCL from the optimum. These deviations were deemed to have minimal impact on the beach/dune system, yet would result in property on which a minimal dwelling could be constructed.

Orderly Development - An attempt was made to establish a CCCL such that future construction would result in orderly development in terms of a fairly continuous alignment. Thus areas developed in accordance with the CCCL would have no individual structures which encroached beyond the general alignment.

Judgment - Finally, geological and coastal engineering judgment was employed to attempt to incorporate the fairly numerous factors considered into a Coastal Construction Control Line which would contribute to the long-term future well-being of the beach and dune system and to the aesthetics of the shoreline.

Criteria Employed in Establishing the Coastal Construction Control Line

The eleven factors described in the preceding section were combined into criteria leading to the recommended locations of the Coastal Construction Control Line. The major criteria are:

(1) Vulnerability During Storms

(2) Alignment of Existing Structures

(3) Buildable Property

(4) Maintaining Structures at Higher Elevations

Table I demonstrates the relationships between each of these four criteria and the factors discussed earlier. The methodology employed in establishing the recommended position of the CCCL included office and field efforts, a combination which formed an appropriate basis for the development of a recommended position of the Coastal Construction Control Line.

Field Studies

Field studies included establishment of the primary dune line and shoreline visits during the preliminary and final stages of developing the recommended location of the Coastal Construction Control Line. During the field visits, sand samples were collected, evidence of seasonal shoreline changes was noted and the shoreline character and evidence of past storms and erosion were noted.

Office Studies

Office studies included examination of aerial photography with special emphasis on recent (February 27, 1984) contoured photography and photography taken the day after Hurricane Frederic made landfall. In addition, charts and reports relating to the long-term shoreline stability were studied.

In order to carry out the development of the recommendations in a systematic manner, a shoreline coordinate system was established with the origin at the Alabama/Florida border and increasing westward to Mobile Point. Figure 1 presents an index map of this coordinate system. This coordinate system formed the basis for referencing various factors relevant to the establishment of the CCCL and also for identifying the individual factors of greatest relevance to the CCCL for particular zones along the shoreline. The distance along the shoreline was referenced in terms of stations, with each station number relating to the distance, in thousands of feet, to the

TABLE I

SUMMARY OF FACTORS CONSIDERED AND THEIR RELATIONSHIP TO THE DETERMINING CRITERIA

Factors Considered	Criteria (and Related Factors)
1. Elevation	
2. Seasonal Variation in Shoreline Position	1. Vulnerability During Storms (1, 2, 3, 4, 5, 6, 7, 11)
3. Planform Irregularities	
4. Vegetation Line	2. Alignment of Existing Structures (8, 10, 11)
5. Primary Dune	3. Buildable Property (8, 11)
6. Past Experience During Storms	
7. Expected Erosion During Storms	4. Maintaining Structures at Higher Elevations (1, 8, 10, 11)
8. Alignment of Existing Structures	
9. Buildable Property	
10. Orderly Development	
11. Judgment	

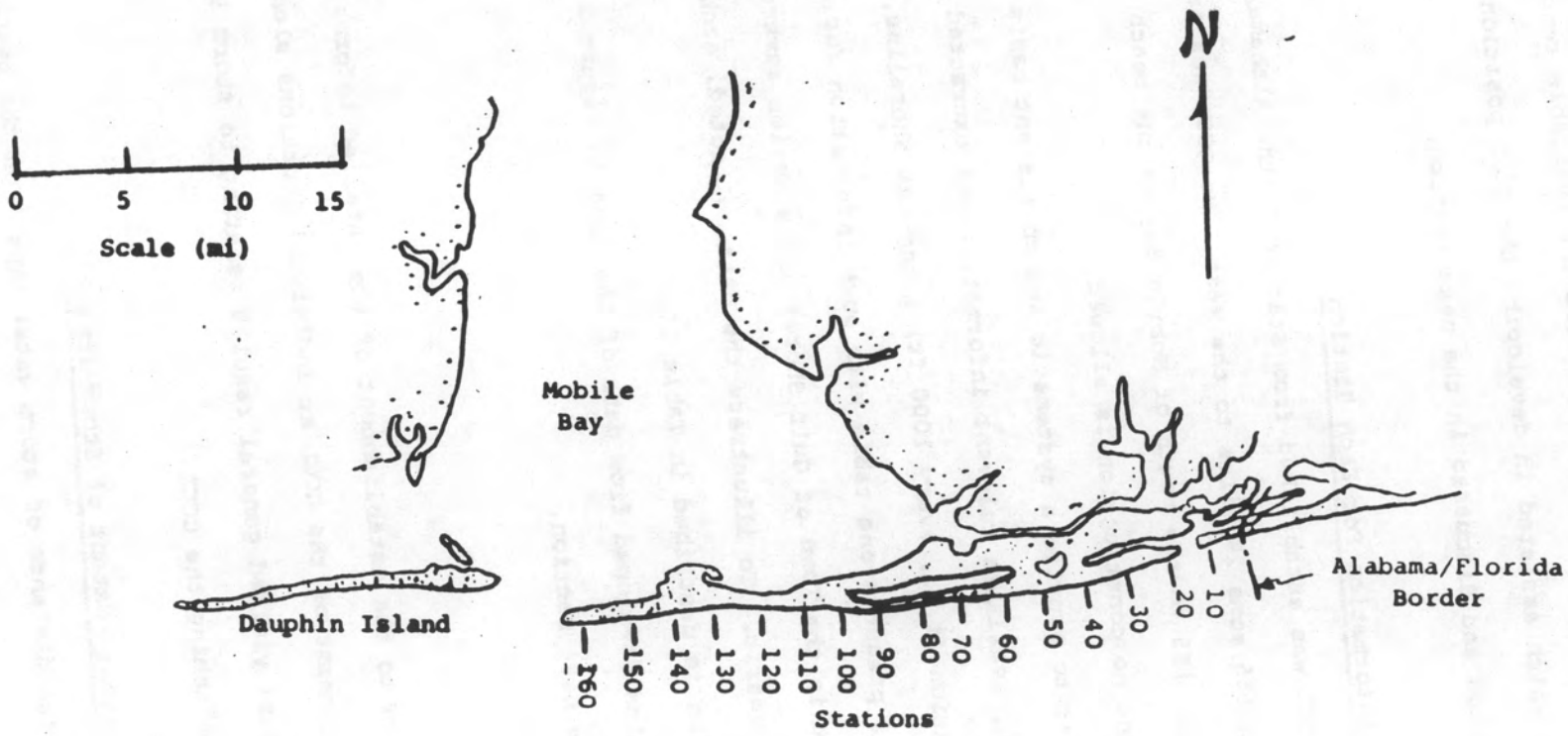

Figure 1. Index Map of Stations Along Baldwin County Shoreline.

west of the Florida/Alabama border. For example, Station 57 is located in the Town of Gulf Shores, 56,000 ft to the west of the Alabama/Florida borde At each station, where possible from the available resources, parameters we complied which assisted in developing the CCCL position. These results wil be presented and discussed in the next section.

Specific Information For Each Station

The CCCL was established from Station 1 (the Alabama/Florida border) to Station 155, some 29 miles to the west. No CCCL was established westward from Station 155 to the mouth of Mobile Bay as the beach is backed by wetlands and no construction is allowed.

In order to provide a systematic and consistent basis for establishment of the CCCL, available relevant information was extracted and summarized at each Station (i.e., every 1000 ft) along the shoreline.

Figure 2 presents one table with such information for Stations 73-78, a region within the Town of Gulf Shores and a region severely impacted by Hurricane Frederic. To illustrate the data collected, each of the columns of information is described in Table II.

The results developed from data of the type in Figure 2 will be described in the next section.

IV. RESULTS

In addition to the establishment of the detailed information resulting in the establishment of the CCCL at individual locations along the shoreline, the studies yielded general results relating to storm impact and the basis for establishing the CCCL.

General Information: - Extent of Storm Impact

The horizontal distance of storm water impact on the beach/dune system

Figure 2

EXAMPLE SUMMARY OF PARAMETERS RELEVANT TO CONTROL LINE ESTABLISHMENT ALONG THE ALABAMA SHORELINE

Station No.	Parameters								Rec. Loc of Control Line From Gulf (ft)
	Max Elev. Within 250' of Gulf (ft)	Crest Height of Island (ft)	Distance to Vegetation Line (ft)	Island Width (ft)	Existing Construction	Hurricane Frederic Experience			
						Depth of Storm Penetration (ft)	Type of Impact	Structural Impact	
73	5	6	130'	900	S.F. 110-160' From Gulf	800	w/o wind	5/6 SF	160
74	4	8	Not Evident	800	S.F. 80-120' From Gulf	800	w/o wind	4/5 SF	120
75	4	8	Not Evident	700	S.F. 60-100' From Gulf	700	w/o Wind	9/9 SF	120
76	4	6	100'	800	S.F. 100-140' From Gulf	800	w/o wind	8/9 SF	160
77	5	8	100'	900	S.F. 160' From Gulf	600	w/o wind	5/5 SF	140
78	5	7	140'	800	S.F. 160-180' From Gulf	800	w/o wind	5/5 SF	170

TABLE II.

DESCRIPTION OF INFORMATION IN FIGURE 2
FOR STATION 74

Column	Description of Information in Column
1	Station Number (74). This station is 73,000 ft to the west of the Alabama/Florida border.
2	The maximum elevation within approximately 250 ft of the shoreline is 4 ft*. (Relative to Mean Sea Level.)
3	The maximum height of the island is approximately 8 ft*. (Relative to Mean Sea Level.)
4	This column indicates the distance from the water edge to the vegetation line. At this station, the vegetation line is not apparent.*
5	The island width is 800 ft at this station.
6	There are single family (S.F.) homes located within 80-100 ft from the water edge.*
7	The depth of storm impact discernible from the post-Frederic aerial photography was 800 ft, i.e., across the entire island width.
8	The type of storm impact was washover (w/o) and possibly wind-blown sand during Hurricane Frederic.
9	In this particular 1000 ft length during Hurricane Frederic, there were four single family homes destroyed of five total present on the Gulf side of the highway.
10	The recommended location of the CCCL relative to the Gulf is 120 ft.

*Based on Aerial Photography of February 27, 1984.

due to Hurricane Frederic ranged from approximately 200 ft to slightly in excess of 1000 ft from the Gulf of Mexico shoreline. Types of impact included beach and dune erosion and overwash deposits of sand. In cases where the barrier island elevation was sufficiently low to permit landward transport of sand, this results in a deficit of sand on the Gulf side and substantial additional erosion occurs. Based on aerial photographs, impact was dominantly erosion, washover deposits, or a combination. However, pre- and post- Frederic profiles conducted by the U.S. Army Corps of Engineers established that dunes with substantial crest elevations could experience significant erosion. Figure 3 presents an example in Gulf Shores, Alabama, between Stations 74 and 75. The initial dune crest was at 16 ft elevation and located some 210 ft from the water's edge. The shoreline was eroded 175 ft and the profile at the location of the dune crest was eroded from an elevation of 16 ft to 4.5 ft. The erosion effects extended some 420 ft inland from the original water edge. The barrier island is quite narrow (approximately 900 ft) at this location.

A general result from the information assembled was that the depth of storm impact correlated positively with decreases in barrier island width and elevation. For stations where the barrier island elevation was less than 10 ft or so and the width less than approximately 800 ft, the storm impact occurred across the entire island width.

Recommended Locations for the Coastal Construction Control Line

The factors described in earlier sections were formulated into the four criteria presented in Table I. The recommended locations of the CCCL were based on the criteria dominant at each location.

The detailed locations of the CCCL for Baldwin County are presented

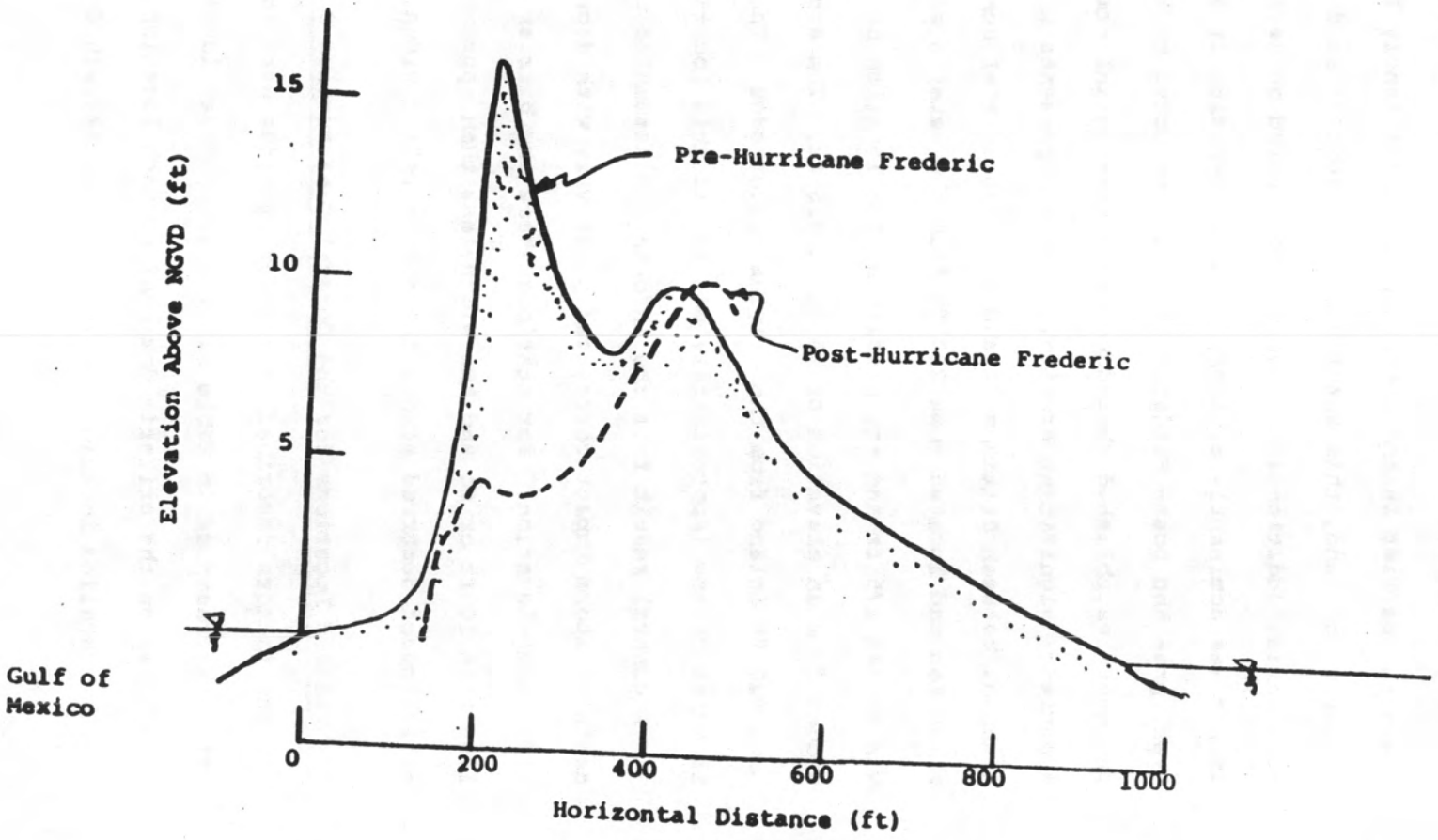

Figure 3. Effects of Hurricane Frederic on Beach/Dune System in Vicinity of Stations 74 and 75.

elsewhere on twenty-eight scaled aerial photograph sheets (scale: 1 inch = 200 ft). For each of the stations, the criteria on which the CCCL are based are presented in the Appendix to this report in tables of the form of Figure 4. These tables include the order of dominance of the four criteria in establishing the CCCL at each station. In Baldwin County, the overall dominant criteria was "Expected Impact During Storms".

The recommended locations of the CCCL are summarized in Figures 5 and 6, along with the dominant and second-most dominant criteria. It is seen that the recommended location ranges from 120 ft to 450 ft from the Gulf of Mexico shoreline (based on February 27, 1984 aerial photography).

Finally, examples will be presented in an attempt to provide insight into the types of terrain and other factors existing where the four different criteria are of varying dominance.

The first example is presented in Figure 7 and is in the Town of Gulf Shores (Stations 58 and 59) and illustrates an area where "Expected Impact Due to Storms" was the dominant criterion. In this area, the elevations are typically low with the peak barrier island elevations generally less than 8 ft and the construction "footprint" typically less than 200 ft from the water's edge. Although there is an existing line of buildings, this line is considered too close to the active beach to allow new construction or reconstruction following storms to occur within this proximity.

The second example illustrates an area where the "Alignment of Existing Structures" is the dominant criterion, Figure 8. In this case, the maximum land elevations are generally in excess of 15 ft and almost all the existing structures are located at distances greater than 200 ft from the shoreline. Although a recommended line position based on storm impact alone would be slightly landward of that shown in Figure 8, the alignment

Figure 4

EXAMPLE SUMMARY OF DOMINANT CRITERIA AT SPECIFIC LOCATIONS ON THE ALABAMA SHORELINE

Station No.	Location	Factor			
		Expected Impact Due to Storms	Alignment of Existing Structures	Buildable Property	Maintain Structures at Higher Elevations
64	Gulf Shores	1*	-	2	-
65	Gulf Shores	1	-	2	-
66	Gulf Shores	2	1	3	-
67	Gulf Shores	2	1	3	-
68	Gulf Shores	2	1	3	-
69	Gulf Shores	2	1	3	-
70	Gulf Shores	2	1	3	-
71	Gulf Shores	2	1	3	-
72	Gulf Shores	2	1	3	-
73	Gulf Shores	3	2	1	-
74	Gulf Shores	3	2	1	-
75	Gulf Shores	3	2	1	-
76	Gulf Shores	3	2	1	-
77	Gulf Shores	1	2	3	-
78	Gulf Shores	3	2	1	-
79	Gulf Shores	2	3	1	-
80	Gulf Shores	2	1	3	-
81	Gulf Shores	2	1	3	-
82	Gulf Shores	2	1	3	-
83	Gulf Shores	2	1	3	-
84	Gulf Shores	2	1	3	-

*Numbers in columns represent relative dominance of various criteria with "1" denoting the most dominant.

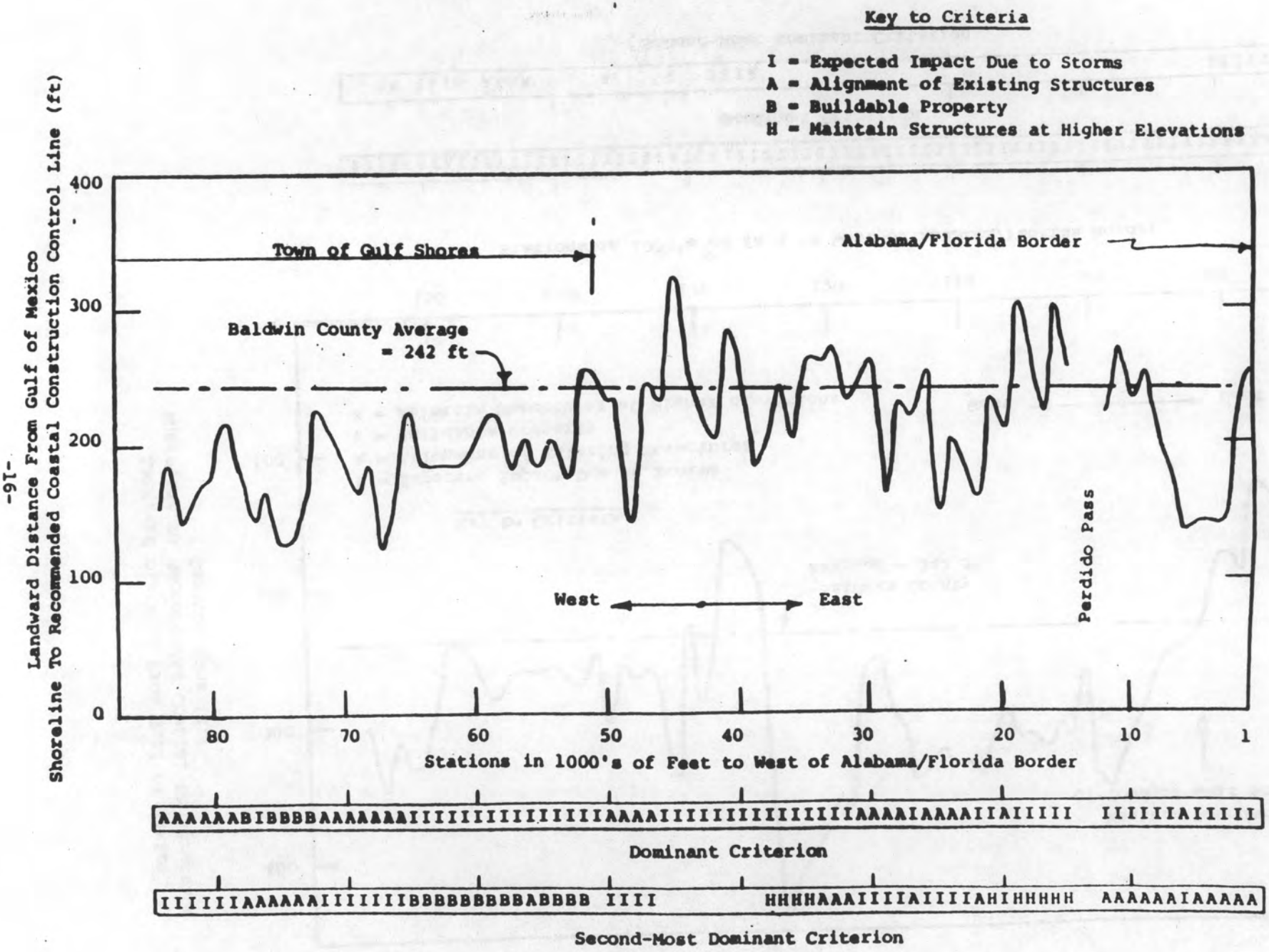

Figure 5. Recommended Location of Coastal Construction Control Line in Eastern Portion of Baldwin County and Dominant Criteria.

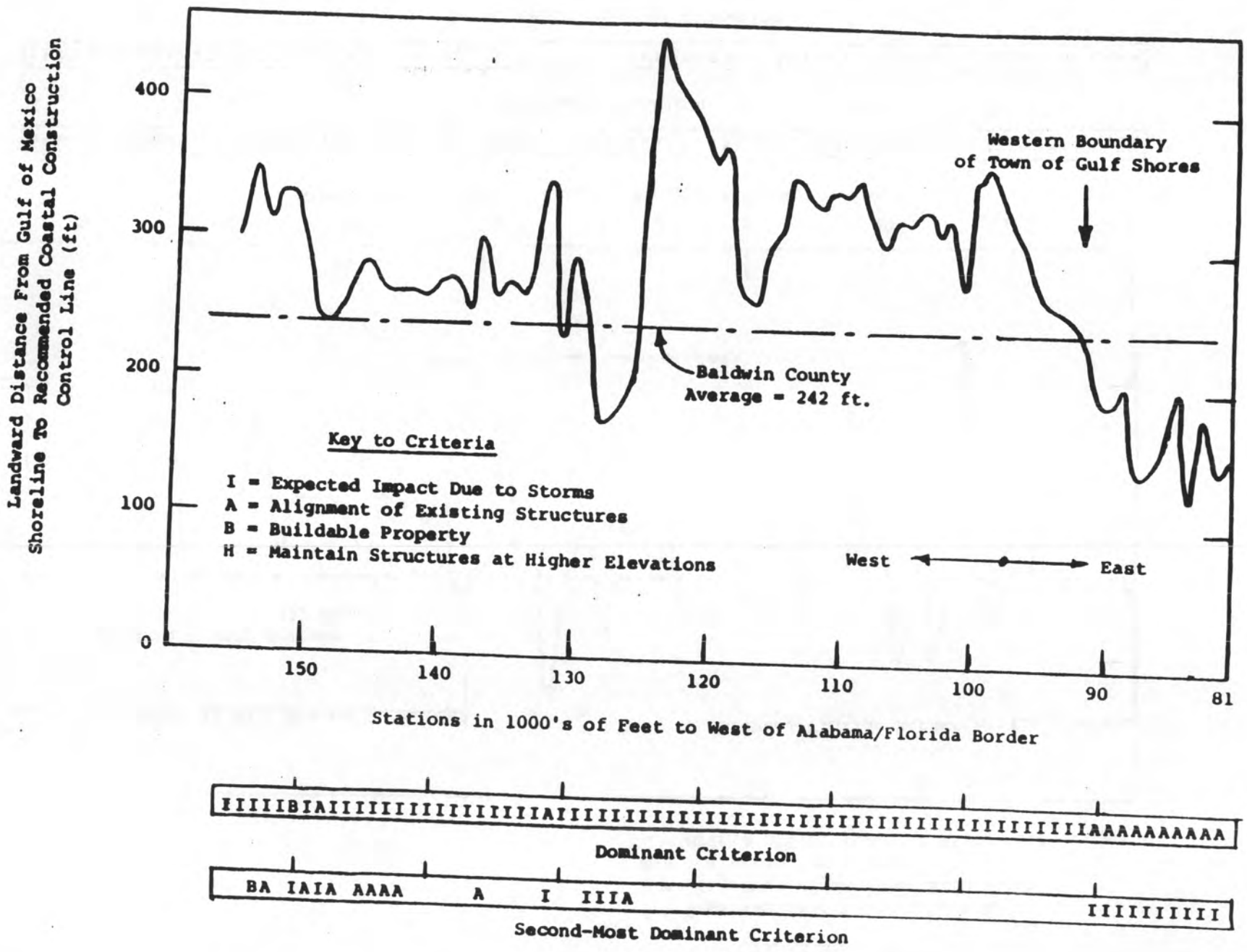

Figure 6. Recommended Location of Coastal Construction Control Line in Western Portion of Baldwin County and Dominant Criteria.

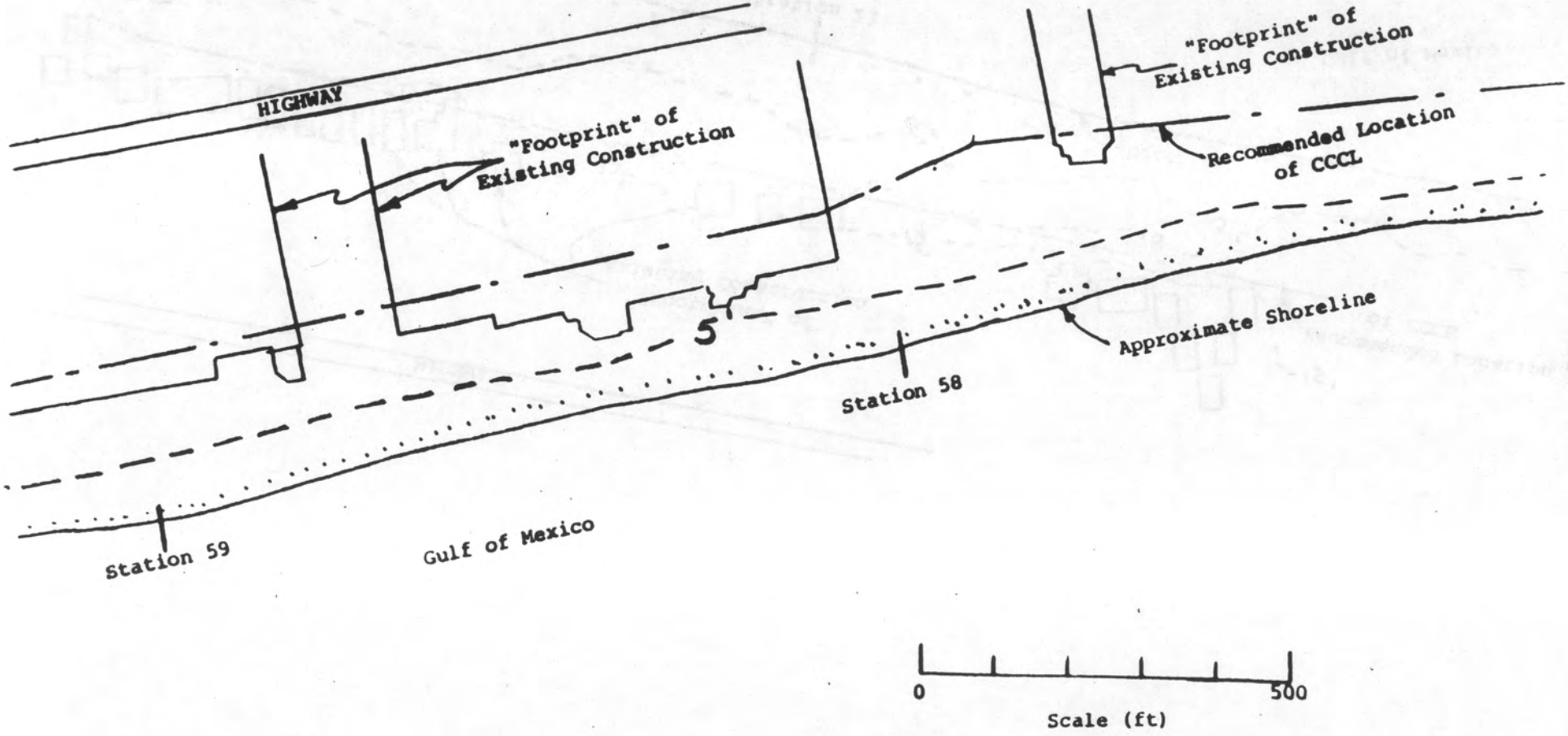

Figure 7 . Planview of Area in Gulf Shores. Example of Area Where Most Dominant Criterion Was "Expected Impact Due To Storms".

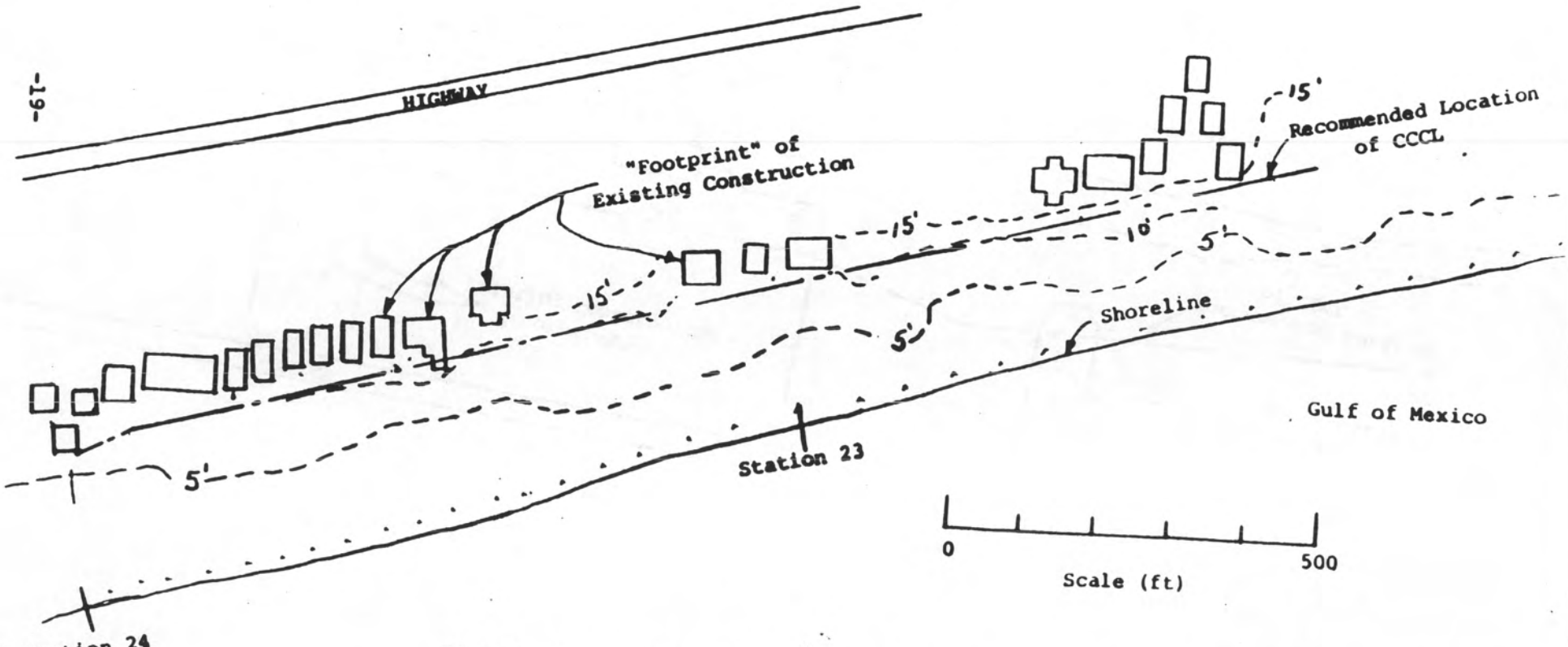

Figure 8. Planview, Showing Example of Area Where "Alignment of Existing Structures" Was Dominant Criterion.

of the existing structure is reasonably consistent and the structures occupy more than 50% of the shoreline. Thus a CCCL which maintains the existing structural alignment was deemed appropriate for this area.

Station 74 in Gulf Shores, Alabama, provides an example where "Buildable Property" was the dominant criterion, Figure 9. At this location, there is only approximately 230 ft from the water to the Highway. Locating the CCCL much farther landward would have the effect of rendering the property not useful for construction.

The fourth criterion "Maintaining Structures at Higher Elevations" is illustrated by a profile through Station 17 (Figure 10) where the peak elevations across the barrier island are on the order of 20 ft. The recommended location of the CCCL is at approximately the 10 ft elevation contour. The distance from the CCCL to the Highway is in excess of 400 ft.

V. REFERENCE

Mobile District, U.S. Army Corps of Engineers, "Hurricane Frederic - Post Disaster Report, 30 August-14 September, 1979", February, 1981.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

MOBILE COUNTY

CONSTRUCTION CONTROL LINE

THIRD ORDER ALABAMA WEST ZONE COORDINATES

MONUMENTS 15 THROUGH 33

DI 15 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard 1.50 miles to Pirates Cove Court, turn south on Pirates Cove Court and proceed approximately 0.1 mile to the end of the pavement and the station on the left.

The station is located on the east side of Pirates Cove Court approximately 50 ft. southeast of the end of the pavement and N89°26'55"E 642.26' from Station 14.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 15 1986.

Plane Coordinates: X = 298,452.81 ft. Y = 91,490.93 ft.

DI 16 To reach station from the junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard 1.30 miles to station on left.

The station is located on the south side of the Island approximately 140 ft. south of Bienville Boulevard, approximately 200 yards southeast of Pig-Out-Pizza, approximately 300 ft. from the Gulf on top of a small sand dune.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 16 1986.

Plane Coordinates: X = 299,539.45 ft. Y = 91,249.84 ft.

DI 17 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard 0.90 miles to the entrance to Dauphin Island public beach; turn south into the entrance and proceed to west end of the parking lot and the station on the south side.

The station is located on the south side of island on the top of a sand dune approximately 175 ft. due west of the last covered picnic shed, approximately 275 ft. north of the Gulf and S82°02'28"E 1974.43 ft. of Station 16.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 17 1986.

Plane Coordinates: X = 301,494.85 Y = 90,976.43 ft.

DI 18 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard 0.90 miles to the entrance to Dauphin Island public beach, turn south into the entrance and proceed to east end of the parking lot. Then walk south on a wood walkway that leads to a fishing pier and station 18 on the east side.

The station is located on the south side of island on top of a sand dune approximately 150 ft. east of a bath house and 15 ft. east of the north end of pier.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 18 1986.

Plane Coordinates: X = 302,259.79 ft. Y = 90,816.16 ft.

DI 19 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard, 0.90 miles to the entrance to Dauphin Island public beach, turn south into the entrance and proceed to the east end of the parking lot. Then walk south on a wood walkway that leads to a fishing pier and station 18 on the east side. From Station 18, proceed S78°52'07"E for 1,176.63 ft. to Station 19.

The station is located on the south side of island on top of a dune, approximately 125 ft. north of Gulf, and is S78°52'07"E 1,176.63 ft. from Station 18.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 19 1986.

Plane Coordinates: X = 303,414.28 ft. Y = 90,588.99 ft.

DI 20 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard, 0.90 miles to the entrance to Dauphin Island public beach, turn south into the entrance and proceed to east end of the parking lot. Then walk south on a wood walkway that leads to a fishing pier and station 18 on the east side, from Station 18, proceed east on beach for 1,784.07 ft. to Station 20.

The station is located on south side of island, on top of a sand dune, approximately 175 ft. north of Gulf, approximately 200 yards west of Golf Course Country Club, and S71°12'49"E 607.44' of Station 19.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 20 1986.

Plane Coordinates: X = 303,989.36 ft. Y = 90,393.36 ft.

DI 21 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard for 0.60 mile to Orleans Street, turn south on Orleans Street and proceed south on Orleans Street for 0.60 miles to the Isle Dauphin County Club parking lot, exit the parking lot and proceed to pro shop and golf cart path which leads to the fairway. Follow cart path to the fairway. Once you reach the fairway, proceed across the fairway S20°E approximately 225 ft. to Station 21.

The station is located on a sand dune S70°E approximately 300 ft. from Country Club Complex, 30 ft. south of Golf Course Fairway approximately 200 ft. north of the Gulf.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 21 1986.

Plane Coordinates: X = 305,101.01 ft. Y = 89,869.47 ft.

DI 22 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go west on Bienville Boulevard, for 0.60 mile to Orleans Street, turn south on Orleans Street and proceed south on Orleans Street for 0.60 miles to the Isle Dauphin County Club parking lot, exit the parking lot and proceed to pro shop and golf cart path which leads to the fairway. Follow cart path to the fairway. Once you reach the fairway, proceed across fairway S20°E approximately 225 ft. to Station 21. From Station 21, proceed S66°20'02"E along sand dune line for 2,508.78 ft. to Station 22.

The station is located on a sand dune approximately 45 ft. south of a fairway, approximately 350 ft. north of the Gulf.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 22 1986.

Plane Coordinates: X = 307,398.80 ft. Y = 88,862.42 ft.

DI 23 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 0.5 miles to Hernando Street, turn south on Hernando and proceed 0.4 mile to the end of pavement, from end of pavement continue 0.2 mile south along sand hiking trail to station 25 on the right. From Station 25 proceed S77°55'58"W along dune line for 1,202.80' to Station 23.

The station is located approximately 10 ft. south of the edge of a golf course fairway, approximately 200 ft. north of he Gulf, and near the north end of a drainage ditch leading to the Gulf.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 23 1986.

Plane Coordinates: X = 307,945.91 ft. Y = 88,885.98 ft.

DI 24 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 0.5 miles to Hernando Street, turn south on Hernando and proceed 0.4 mile to the end of pavement, from end of the pavement continue 0.2 mile south along sand hiking trail to station 25 on the right. From Station 25, proceed N87°39'09"W for 266.24 ft. along the sand dunes to Station 24.

The station is located in the dunes on the west edge of a group of 4" to 6" diameter pine trees approximately 25 ft. east of the edge of a golf course fairway.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 24 1986.

Plane Coordinates: X = 308,855.90 ft. Y = 89,139.20 ft.

DI 25 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 0.5 miles to Hernando Street, turn south on Hernando and proceed 0.4 mile to the end of pavement, from the end of pavement continue 0.2 mile south along sand hiking trail to the station on the right.

The station is located on the south side of island on a small dune approximately 250 ft. west of sand hiking trail, 150 ft. north of Gulf.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 25 1986.

Plane Coordinates: X = 309,122.13 ft. Y = 89,137.43 ft.

DI 26 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 0.5 miles to Hernando Street, turn south on Hernando and proceed 0.4 mile to the end of pavement, from the end of the pavement continue 0.2 mile south along sand hiking trail to station 25 on right. From sand hiking trail (which is 250 ft. east of Station 25), proceed S75°E through dunes approximately 500 ft. to Station 26.

The station is located on the south side of island back inside the small dunes from the beach approximately 1,200 ft. due west of Sand Castle Condo's.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 26 1986.

Plane Coordinates: X = 309,863.39 ft. Y = 88,948.32 ft.

DI 27 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard 0.85 mile to Forney Street, turn south on Forney Street and proceed 0.5 mile to Sand Castle Condo's and Station 27.

The station is located on the south side of the island on a small dune approximately 51 ft. southeast of the southeast corner of Sand Castle Condo's, approximately 100 ft. east of the northeast corner of the swimming pool.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 27 1986.

Plane Coordinates: X = 311,275.88 ft. Y = 88,837.93 ft.

DI 28 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 0.85 mile to Forney Street, turn south on Forney Street and proceed 0.5 mile to Sand Castle Condo's and Station 27. From Station 27 proceed N82°55'57"E 2,236.52 ft. east along dunes to Station 28.

The station is located on the south side of Dauphin Island back inside the dunes from the beach on a small sand dune, 85.3 ft. S48°16'03"E of Corps of Engineers' marker 21 DIE approximately 200 ft. north of the Gulf, 2,224 ft. east of Sand Castle Condo's.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 28 1986.

Plane Coordinates: X = 313,495,41 ft. Y = 89,113.09 ft.

DI 29 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 2.45 miles to the end of Bienville Boulevard. Proceed from end of the pavement on Bienville Boulevard west along beach 2,838.58 ft. to Station 29.

The station is located on the southeast side of Dauphin Island back inside of sand dunes from the beach on a small sand dune approximately 150 ft. north of the Gulf 69 ft. due south of a 10 inch pine approximately 100 ft. S70'E of three pines growing together, and S77°42'44"W 1,396.80 ft. of Station 29.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 29 1986.

Plane Coordinates: X = 315,123.09 ft. Y = 89,633.15 ft.

DI 30 To reach station from junction of Bienville Boulevard and Lee Moyne Drive (at the water tower) on Dauphin Island, go east on Bienville Boulevard, 2.45 miles to the end of Bienville Boulevard. Proceed west from end of pavement on Bienville Boulevarc 1,459.79 ft. to Station 30.

The station is located on Coast Guard property approximately 125 ft. north of the Gulf approximately 175 ft. due south of grey buildings approximately 375 ft. S80°E of a block building, and S85°05'59"W 453.64 ft. from Station 31.

The station is an aluminum disk set in the top of a 6"x6" concrete post projecting 4"-6" and stamped ADEM DI 30 1986.

Plane Coordinates: X = 316,487.91 ft. Y = 89,930.34 ft.