Lee County
Blind Pass Restoration
Project

Joint Coastal Permit
Application

April 2006

ECE

WBE/Small Business
Lic. In: FL, SC, NC, LA, AL

1819 Main Street, Suite 402
Sarasota, FL 34236
Telephone 941•952•0487
Facimile 941•952•0489
ericksonconsultingengineers.com

May 1, 2006

Mr. Michael Nowicki
Permitting Section
United States Army Corps of Engineers
701 San Marco Blvd.
Jacksonville, FL 32207

RE: BLIND PASS RESTORATION PROJECT

Dear Mr. Nowicki:

The purpose of this letter is to formally submit the enclosed Joint Coastal Permit Application for the Blind Pass Restoration Project in Lee County. Per the electronic application submittal guide, three hard copies of the application and supporting documents and one CD are included. This application is also being submitted in its entirety to the State of Florida Department of Environmental Protection (to the attention of Marty Seeling) under separate cover.

In addition, please send a copy of all outgoing correspondence pertaining to this permit application to Mr. Robert Neal at Lee County Division of Natural Resources, P.O. Box 398, Ft. Myers, Florida 33901 (239-479-8566 Phone and 239-479-8108 Fax). If you have any questions, please get in touch with me.

Sincerely,
ERICKSON CONSULTING ENGINEERS

Karyn M. Erickson / dcg
Karyn M. Erickson, P.E.
President

KME:kmn

Enclosures

cc: Mr. Robert Neal, Lee County Division of Natural Resources
Mr. Steve Boutelle, Lee County Division of Environmental Services

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Sarasota, FL 34236
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May 1, 2006

Mr. Marty Seeling
Environmental Administrator
Florida Department of
Environmental Protection
3900 Commonwealth Boulevard
Mail Station 300
Tallahassee, FL 32399-3000

RE: BLIND PASS RESTORATION PROJECT

Dear Mr. Seeling:

The purpose of this letter is to formally submit the enclosed Joint Coastal Permit Application for the Blind Pass Restoration Project in Lee County. Per the electronic application submittal guide, three hard copies of the application and supporting documents and one CD are included. This application is also being submitted in its entirety to the U.S. Army Corps of Engineers Jacksonville District (to the attention of Michael Nowicki) under separate cover.

If you have any questions or concerns please feel free contact me.

Sincerely,
ERICKSON CONSULTING ENGINEERS, INC.

Karyn M. Erickson / Acq

Karyn M. Erickson, P.E.
President

KME:kmn

Enclosures

cc: Mr. Robert Neal, Lee County Division of Natural Resources
Mr. Steve Boutelle, Lee County Division of Environmental Services

JOINT APPLICATION
FOR
JOINT COASTAL PERMIT

AUTHORIZATION TO USE
SOVEREIGN SUBMERGED LANDS

FEDERAL DREDGE AND FILL PERMIT

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
U.S. ARMY CORPS OF ENGINEERS

DEP Form 73-500 (6/95)

JOINT APPLICATION FOR JOINT COASTAL PERMIT/AUTHORIZATION TO USE SOVERN SUBMERGED LANDS/FEDERAL DREDGE AND FILL PERMIT

APPLICATION INSTRUCTIONS

MAIL TO:

Florida Department of Environmental Protection
Division of Water Resource Management
Bureau of Beaches and Coastal Systems
3900 Commonwealth Boulevard - Mail Station 300
Tallahassee, Florida 32399-3000

STREET ADDRESS:

(Do Not Mail to this address, For Hand Delivery Only)
Capital Center
5050 West Tennessee Street
Building B
Tallahassee, Florida

INTRODUCTION

Attached is a Joint Coastal Permit application for:

1) activities which require an individual permit under Part IV Chapter 373, F.S.;
2) activities which require authorization to use sovereign submerged lands;
3) activities which require a federal dredge and fill permit; and
4) activities regulated under Chapter *161.041,* F.S.

Certain activities may qualify for an exemption. If any activity qualifies for an exemption, an application is not required, although the use of this application form is the most expeditious way for the agencies to make the determination that the activity qualifies for an exemption.

COPIES/APPLICATION FEES

Submit one original signed application form plus five copies of the form and six complete sets of all the requested drawings and other information to the Department. Submit the appropriate fee with your application. Application fees are listed on the attached worksheet.

DISTRIBUTION TO THE U.S. ARMY CORPS OF ENGINEERS

When activities are proposed in, on or over wetlands or other surface waters, the Department shall forward a copy of the application to the Army Corps of Engineers (ACOE). The ACOE will advise you of any additional information that may be required to complete the federal dredge and fill portion of the permit application. The information requested in this application form may be more than required to make a complete application to the ACOE. However, it is useful and may be essential for subsequent evaluation.

CONSULTATION

Applicants are encouraged to consult with Department staff prior to submittal of the formal application. If you have any questions, please consult with the staff of the Department of Environmental Protection (DEP), Bureau of Beaches and Coastal Systems prior to submittal of the formal application.

The applicant is required to provide the information on page six. Failure to provide this information will delay processing.

NOTE: The information listed in this application package is not intended to be all-inclusive. Additional information may be requested by the reviewing agency in order to complete your application.

JOINT APPLICATION FOR JOINT COASTAL PERMIT/AUTHORIZATION TO USE SOVERN SUBMERGED LANDS/FEDERAL DREDGE AND FILL PERMIT

GENERAL APPLICATION INFORMATION

Please Type or Print in BLACK Ink

FOR AGENCY USE ONLY

ACOE Application Number: _____ DEP Application Number: _____

Date Application Received: _____ Date Application Received: _____

1. Name of authorized agent for permit application (if applicable)		Mailing Address	
Karyn Erickson		1819 Main St, Suite 402	
City	State	Zip Code	Telephone
Sarasota	Florida	34236	(941) 952-0487
2. Name of applicant		Mailing Address	
Lee County Board of County Commissioners		P.O. Box 398	
City	State	Zip Code	Telephone
Fort Myers	Florida	32902-0398	(239) 479-8128

3. Name of activity

Blind Pass Restoration

4. Location of activity (use additional sheets, if needed):

County(ies) Lee County

Section(s) 02 Township 46S Range 21E

Section(s) 11 Township 46S Range 21E

Section(s) 13 and 14 Township 46S Range 21E

Latitude 26° 29' 06.21541 to 26° 27' 53.83108 Longitude 82° 11' 02.61037 to 82° 09' 57.27322

State Plane Coordinates N=782037.3 E=595963.0 to N=774720.8 E=601890.0

DNR reference monument(s) R-108 to R-118

Land Grant name, if applicable N/A

Tax Parcel Identification Number See additional information item #4

Street address, road, or other location See additional information item #4

City, Zip Code if applicable See additional information item #4

5. Describe in general terms the proposed activity including any phasing.

The activity includes the maintenance dredging of Blind Pass, located between Captiva and Sanibel Island in Lee County, Florida. Beach compatible material will be placed on adjacent beaches and non-suitable material being disposed of in an approved manner.

6. Are you requesting any exemptions? ☐ YES ☒ NO If yes, provide explanation and cite rule number(s)

7. Describe the purpose and need of the proposed activity including any public benefits.

Provide a stable Pass opening avoiding significant adverse impacts to the environment and adjacent shoreline by utilizing the less impactive alternative, while relieving a public hardship created by the pass closure and ecosystem degradation. Placement of compatible material on the adjacent beaches to enhance a public need along a critically eroded shoreline; and restore the inlet system allowing the pass to function naturally in an equilibrium state.

☐ **Check here if information is continued on an attached sheet.**

8. Identify the requested permit duration 15 years.

9. Please identify by number any Wetland Resource/ERP/ACOE Permits pending, issued or denied for projects at the location, and any related enforcement actions.

Agency	Date	No./Type of Application	Action Taken
DEP	March 24, 2000	0152782-001-JC	Issued
DEP	November 1, 2004	0200131-001-JC	Issued
DEP	October 19, 2005	0200269-001-JC	Issued

10. Have you obtained approval from the Department of State, Division of Historical Resources? ☐ YES ☒ NO If yes, provide a copy of **the letter of approval.**

11. Has an Erosion Control Line been established pursuant to Sections 161.141 - 161.211, Florida Statutes? ☒ YES ☐ NO

12. Are you requesting authorization to use Sovereign Submerged Lands? ☒ YES ☐ NO ☐ UNDETERMINED

	Attached	To Be Provided
ALL APPLICANTS ARE TO SUBMIT THE FOLLOWING ITEMS AS ATTACHMENTS:		
13. A copy of the Division of State Lands title determination. If you do not have title determination, department staff will request that the Division of State Lands conduct a title check.	☐	☒
14. Written evidence of title to the subject riparian upland property in the form of the recorded deed, title insurance, legal opinion of title, or a long term lease which specifically includes riparian rights. Evidence submitted must demonstrate that the applicant has sufficient title interest in the riparian upland property. If the applicant is not the property owner, then authorization for such use from the property owner must be provided.	☐	☒
15. A detailed statement describing the existing and proposed upland uses and activities. For projects sponsored by a local government, indicate whether or not the facilities will be open to the general public. Provide a breakdown of any user fees that will be assessed to the general public and indicate whether or not such user fees will generate revenue or will simply cover costs associated with maintaining the facilities.	☒	☐
16. A list of the names and addresses of owners of all riparian property within 1,000 feet (and within a 500 ft radius) of the proposed coastal construction, from the latest county tax roll. If the property is under cooperative or condominium ownership, the name and mailing address of the cooperative or condominium association will be adequate.	☒	☐
17. Written evidence, provided by the appropriate governmental agency having jurisdiction over the activity, that the proposed activity, as submitted to the Department, is consistent with the state-approved Local Comprehensive Plan.	☐	☒
18. A fee, as set forth in Rule 62B-49.006, Florida Administrative Code.	☐	☒

19.SIGNATURE(S)

A. By signing this application form, I am applying, or I am applying on behalf of the applicant, for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application and represent that such information is true, complete and accurate. I understand this is an application and not a permit, that work prior to approval is a violation, and any permit issued or proprietary authorization issued pursuant thereto, does not relieve me of any obligation for obtaining any other required federal, state, water management district or local permit prior to commencement of construction. I agree, or I agree on behalf of my corporation, to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a responsible operation entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Karyn M. Erickson, P.E.

Typed/Printed Name of Applicant (If no Agent is used) or Agent (If one is so authorized below)

Signature of Applicant/Agent Date

Erickson Consulting Engineers, Inc.

(Name of political subdivision, municipality, or business entity and title of person signing on its behalf, if applicable)

AN AGENT MAY SIGN ABOVE ONLY IF THE APPLICANT COMPLETES THE FOLLOWING:

B. I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above; and to furnish, on request, supplemental information in support of the application. In addition, I authorize the above-listed agent to bind me, or my corporation, to perform any requirement which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U..S.C. Section 1001.

Typed/Printed Name of Applicant Signature of Applicant Date

Lee County, Florida

(Name of political subdivision, municipality, or business entity and title of person signing on its behalf, if applicable)

Please note: The applicant's original signature (not a copy) is required

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

C. I either own the property described in the application or I have legal authority to allow access to the property, and I consent, after receiving prior notification, to any site visit on the property by agents or personnel from the Department of Environmental Protection and the U.S. Army Corps of Engineers necessary for the review and inspection of the proposed project specified in this application. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review and inspection. Further, I agree to provide entry to the project site for such agents or personnel to monitor permitted work if a permit is granted.

Typed/Printed Name of Applicant Signature of Applicant Date

Lee County, Florida

(Name of political subdivision, municipality, or business entity and title of person signing on its behalf, if applicable)

INFORMATION FOR ASSESSMENT OF IMPACTS TO THE COASTAL SYSTEM

ALL APPLICANTS ARE TO SUBMIT THE FOLLOWING ITEMS AS ATTACHMENTS:

	Attached	To Be Provided	Waiver Requested	Not Applicable
20. Two copies of a topographic and bathymetric survey drawing of the proposed project site in accordance with Rule 62B-41.007(l)(h), F.A.C. Identify the elevation of the mean high water and mean low water referenced to NGVD for each wetland or surface water site and the source of the tidal datum information.	☒	☐	☐	☐
21. Provide a legal description of all property involved including sovereign submerged land used in carrying out the project.	☐	☒	☐	☐
22. Describe how boundaries of wetlands or other surface waters were determined. If there has ever been a jurisdictional declaratory statement, a formal wetland determination, a formal determination, a validated informal determination, or a revalidated jurisdictional determination, provide the identifying number.	☒	☐	☐	☐
23. An engineering description or as-built drawings, if available, of any existing structures on the site which may be directly or indirectly affected by, or which may directly or indirectly affect, the proposed activity.	☒	☐	☐	☐
24. Two complete sets of construction plans and specification for the proposed activity, certified by an engineer duly registered pursuant to Chapter 471, Florida Statutes. The plans shall include the following:	☐	☒	☐	☐
a. Plan view of the proposed activity depicting the mean high-water line any easement boundary, or the erosion control line, within the area of influence of the proposed activity. Identify the boundaries of significant geographical features (e.g., channels, shoals) and natural communities (e.g., submerged grass beds, hardbottom, or mangroves) within the area of influence of the activity.	☐	☒	☐	☐
b. A sufficient number of elevation views of the proposed activity depicting the mean high-water line, any easement boundary, and the erosion control line, within the area of influence of the proposed activity. Identify the boundaries of significant geographical features and natural communities in the area of influence of the proposed activity.	☐	☒	☐	☐
c. Details of construction, including materials and general construction procedures and equipment to be used (e.g., construction access, dredging method, dredged material containment, pipeline location).	☐	☒	☐	☐
25. In addition to the full-size drawings requested above, the information required under Paragraphs (20), (23) and (24) above shall be provided on 8 1/2-inch by 11-inch paper.	☒	☐	☐	☐
26. An aerial map of a scale of 1" = 200', showing: the project boundaries, DNR Reference Monument locations, major county landmarks, and special aquatic or terrestrial sites (parks, sanctuaries, refuges, etc.) within the project boundary and one quarter mile in both shore parallel directions of the project boundary;	☒	☐	☐	☐
27. A proposed construction schedule.	☐	☒	☐	☐
28. Permit applications for excavation or fill activities shall include the following detailed information concerning the material to be excavated:	☒	☐	☐	☐
a. Core boring logs and sediment grain size analyses from representative points throughout the area to be excavated. 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 NGVD and the material in each stratum classified according to grain size.	☒	☐	☐	☐
b. Particle size analysis to the sediment and a measure of the percent organics by dry weight. Gradation curves should be produced from sieve analysis of each stratum in the core. Grain size distribution must be determined down to the standard unit 200 sieve size.	☒	☐	☐	☐
c. Chemical analyses shall be required if there is reason to suspect that the sediments are contaminated.	☐	☐	☐	☒

	Attached	To Be Provided	Waiver Requested	Not Applicable
29. Using an established natural community classification system, describe each natural community within the area of influence of the proposed activity and include:	☒	☐	☐	☐
a. Acreage.	☒	☐	☐	☐
b. Identification of the flora and fauna to the lowest taxon practicable.	☒	☐	☐	☐
c. Characterization of dominant and important flora and fauna and estimates of percent biotic cover.	☒	☐	☐	☐
d. Sampling locations, date of sampling or measurements; and methods used for sampling.	☒	☐	☐	☐
30. Detailed information on season of occurrence, density, and location of threatened or endangered species whose range occurs within the proposed activity.	☒	☐	☐	☐
31. Results of available wildlife surveys that have been conducted on the site, and any comments pertaining to the proposed activity from the Florida Game and Fresh Water Fish Commission and the U.S. Fish and Wildlife Service.	☒	☐	☐	☐
32. A general description of all commercial and recreational fisheries, diving regions, and other recreational uses within the area of influence of the proposed activity.	☒	☐	☐	☐
33. Analysis of the expected effect of the proposed activity on the coastal system including but not limited to:	☒	☐	☐	☐
a. Analysis of the expected effect of the proposed activity on the existing coastal conditions and natural shore and inlet processes.	☒	☐	☐	☐
b. Analysis of the compatibility of the fill material with respect to the native sediment at the disposal site. The analysis should include all relevant computations, the overfill ratios, and composite graphs of the grain-size distribution of the fill material and the native sediment at the disposal site.	☒	☐	☐	☐
c. Demonstration of consistency with an inlet management plan or a proposed draft inlet management plan in accordance with Rule 62B-41.005(16), F.A.C. If the proposed project is not included in the inlet management plan the applicant will provide the information specified in Rule 62B-41.008(l)(m), F.A.C.	☐	☒	☐	☐
d. Analysis of how water quality and natural communities will either be impacted, undisturbed, preserved or maintained within the area of influence of the proposed activity with an estimate of the affected acreage of each impacted community.	☒	☐	☐	☐
34. Describe the location and details of the erosion, sediment and turbidity control measures to be implemented during each phase of construction and all other measures used to minimize adverse affects to water quality.	☐	☒	☐	☐
35. Describe any methods proposed to protect threatened or endangered species.	☐	☒	☐	☐
36. A written statement providing the necessity and justification for the potential impacts to the coastal ecosystem which may be caused by the proposed coastal construction.	☐	☒	☐	☐
37. A narrative description of any proposed mitigation plans, including purpose, maintenance, monitoring, estimated cost, construction sequence and techniques.	☐	☒	☐	☐
38. An analysis of available alternatives to the proposed coastal construction, on meeting the stated performance objectives and any related affects on the coastal system.	☐	☒	☐	☐

NOTE: Additional information may be required by statute or rule, or if found by staff to be reasonably necessary for proper evaluation of the application under applicable statutory and rule criteria.

Specific Authority 161.041, 253, 258, 370.021, 370.12 Part IV of 373, Florida Statutes

JOINT APPLICATION FOR JOINT COASTAL PERMIT/AUTHORIZATION TO USE SOVERN SUBMERGED LANDS

NOTICE OF RECEIPT OF APPLICATION

This information is required in addition to that required in other sections of the application. Please submit five copies of this notice of receipt of application and all attachments with the other required informati on. Please submit all information on 8 1/2" x 11" paper.

Project Name: Blind Pass Restoration Project
County: Lee
Owner: Lee County
Applicant: Lee County Board of County Commissioners
Applicant's Address: P.O. Box 398
Fort Myers, Florida, 32902-0398

1. Indicate the activity boundaries on a USGS quadrangle map. Attach a location map showing the boundary of the proposed activity. The map should also contain a north arrow and a graphic scale; show Section(s), Township(s), and Range(s); DNR reference monuments; political boundaries; identifiable landmarks; and must be of sufficient detail to allow a person unfamiliar with the site to find it.

2. Attach a depiction (plan and section views), which clearly shows the construction or other activities proposed to be constructed. Use multiple sheets, if necessary. Use a scale sufficient to show the location and type of work.

3. Provide the names of all wetlands, or other surface waters that would be dredged, filled, impounded, diverted, drained, or would receive discharge (either directly or indirectly), or would otherwise be impacted by the proposed activity, and specify if they are in an Outstanding Florida Water or Aquatic Preserve:

   Wulfert Channel, Roosevelt Channel, Gulf of Mexico

4. Briefly describe the proposed project (such as "beach restoration", "inlet maintenance dredging", "terminal groin"): Inlet Maintenance Dredging

5. Specify the acreage of wetlands or other surface waters, by natural community type, that are proposed to be filled, excavated, or otherwise disturbed or impacted by the proposed activity:

   To be determined based upon final channel alignment

6. Provide a brief statement describing any proposed mitigation for impacts to natural communities (attach additional sheets if necessary): A mitigation plan will be submitted to the department upon completion.

FOR AGENCY USE ONLY

Application Name:
Application Number:
Office where the application can be inspected:

Note to Notice recipient: The information in this notice has been submitted by the applicant, and has not been verified by the agency. It may be incorrect, incomplete or may be subject to change.

Joint Coastal Permit Application
Additional Information

Lee County
Blind Pass Restoration Project

JCP Item #4.
Attachment #4 provides the tax parcel identification number and addresses of the properties within the project area.

JCP Item #9.
ERP 36-0233299-001 and SAJ-2004-6950(NW-MN)

JCP Item #10.
A letter of approval shall be requested by the Florida Department of State, Division of Historical Resources which will be provided when it becomes available.

JCP Item #11.
An Erosion Control Line was established for the beach nourishment placement area(s) in October 2005.

JCP Item #12.
A submerged lands easement for the proposed dredge area will be submitted under separate cover.

JCP Item #13.
We request that a title determination be conducted upon receipt of this application.

JCP Item #14.
Written evidence of title to the riparian upland property in the form of a recorded deed shall be provided.

JCP Item #15.
Proposed upland uses include public beach parks adjacent on both sides of Blind Pass and along the shoreline south of the pass. The parks provided are open to the public with paid parking on an equal basis to all. A breakdown of the user fees will be provided under separate cover.
Restoration of the Pass will relieve a public hardship created by the Pass closure and ecosystem degradation. The placement of compatible material on the adjacent beaches will enhance a public need along a critically eroded shoreline.

JCP Item #16.
A list of names and addresses of owners of a riparian property within 1,000 feet (and within a 500 foot radius) of the proposed coastal construction is included in this application as Attachment #16.

JCP Item #17.
A letter from Lee County providing consistency determination will be transmitted at a later date under separate cover.

JCP Item #20.
Copies of the topographic and bathymetric survey drawing of the proposed project site with the elevation of the mean high water and the mean low water referenced to NAVD are presented as Attachment #20.

JCP Item #21.
A submerged lands easement for the proposed dredge area shall be provided.

JCP Item #22.
The boundary of the Gulf of Mexico and channels surface water was taken as the location where the beach profile is intersected by the horizontal plane of mean high water (MHW). According to the Land Boundary Information System (www.labins.org), MHW is located at +0.28 ft NAVD shoreline segment within the project area as Attachment #20. This elevation defines the boundary between the jurisdictional wetlands and upland properties.

JCP Item #23.
The terminal groin is located at the north side of the proposed pass channel (DNR monument R- 109) and the bridge is placed across the proposed maintenance channel area (located between DNR monument R-109 and R-110). Record drawings for bridge are attached in Attachment #23. The terminal groin on the north side of the pass was extended 100 ft in 1988.

JCP Item #24.
Complete construction plans and specifications are not currently available. It is requested that these be considered a final "notice to proceed" item. Details of construction will be prepared and submitted at a later date.

a. A plan view of the proposed design shall be provided once the applicant has analyzed alternate channel alignments to determine the least environmentally impacted areas and most beneficial options. The drawings shall depict the MHW and MLW lines, as well as the location of natural communities within the area of influence of this activity. The location and type of natural communities within the proposed project area were determined by Dial Cordy and Associates.

b. Section views of the proposed dredge area and the proposed beach fill area will be provided at a later date.

c. Details of construction shall be submitted at a later date as part of the final design specifications.

JCP Item #25.
See Attachment #25.

JCP Item #26.
Aerial maps of the project area of scale 1'=200' showing the project boundaries, DNR Reference Monument locations, major county landmarks, and special aquatic or terrestrial sites within the project boundary is included as Attachment #26.

JCP Item #28.
Attachment #28 under separate cover contains detailed information pertaining to the geotechnical analysis and the composite characteristics and volumes of the material from the proposed channel dredging.

a. Attachment #28 under separate cover contains detailed information of the geotechnical analysis that was conducted for the project.

b. Attachment #28 under separate cover contains the grain size distributions for the geotechnical investigations preformed for this project.

c. There is no reason to suspect any chemical contamination of the dredge area sediments. Therefore, no chemical analysis has been performed.

JCP Item #29.

a. Attachment #29 under separate cover contains detailed information of the environmental baseline analysis that was conducted for the project.

b. Attachment #29 under separate cover contains the grain size distributions for the environmental baseline analysis preformed for this project.

c. Attachment #29 under separate cover contains detailed information of the environmental baseline analysis performed for this project.

d. Attachment #29 under separate cover contains detailed information of the environmental baseline analysis performed for this project.

JCP Item #30.

Detailed information on seasonal occurrence, density, and location of threatened or endangered species whose range occurs within the proposed Project will be provided in Attachment #29.

JCP Item #31.

Attachment #29 under separate cover contains detailed information of the environmental baseline analysis performed for this project.

JCP Item #32.

The project area is used primarily for recreational fishing and beach user activities.

JCP Item #33.

a. Hydrodynamic numerical analysis of alternative channel alignments for the proposed activity were performed and included with more detailed results in Design Report (Attachment #33). In addition, a further analysis of the expected effect of the proposed activity on the existing coastal conditions and natural shore and inlet processes is being conducted in detail for the Environmental Assessment document.

b. An analysis of the compatibility of the dredged material with respect to the native sediment will be prepared for the dredge channel(s) once final geometries are determined. Chapter 62B-41, Florida Administrative Code will be used in evaluating the compatibility of material found within the cut area and the native beach. Sediment Composites of the preferred alternative are included in the Design Report.

c. The proposed project is consistent with goals of the Draft Inlet Management Plan, which have been adopted into the State's strategic Beach Management Plan. Specifically, the goals are to bypass 37,250 cubic yards annually to adjacent beaches, and implement a comprehensive monitoring program to manage the pass.

d. Attachment #29 under separate cover contains detailed information of the environmental impacts to natural communities for this project.

Attachment # 4

Properties within Project Area

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-00-00017.0080	17201 CAPTIVA DR CAPTIVA FL 33924	MADDEN MARJORIE	P O BOX 305	CAPTIVA, FL 33924
11-46-21-00-00017.0090	17181 CAPTIVA DR CAPTIVA FL 33924	SHEETZ CHARLES H + GAIL R	PO BOX 131	CAPTIVA FL 33924
11-46-21-00-00017.0100	17171 CAPTIVA DR CAPTIVA FL 33924	MULLINS MICHAEL C + CANNELLA C	PO BOX 880	CAPTIVA FL 33924
11-46-21-00-00017.010A	17170 CAPTIVA DR CAPTIVA FL 33924	MULLINS MICHAEL C + CANNELLA C	PO BOX 880	CAPTIVA FL 33924
11-46-21-00-00017.0110	17130 CAPTIVA DR CAPTIVA FL 33924	DUVAL FRANK E + JEANNINE F	4557 CROSSFIELDS RD	TOLEDO OH 43623
11-46-21-00-00017.011A	17121 CAPTIVA DR CAPTIVA FL 33924	WILLIAMS THOMAS W	P O BOX 1088	CAPTIVA FL 33924
11-46-21-00-00017.012A	17101 CAPTIVA DR CAPTIVA FL 33924	COURTER JAMES A + CARMEN M	17 MOCKINGBIRD	HACKETTSTOWN NJ 07840
11-46-21-00-00017.0130	17041 CAPTIVA DR CAPTIVA FL 33924	WILSON RODNEY M + WILSON JENIFER A	17041 CAPTIVA DR	CAPTIVA FL 33924
11-46-21-00-00017.0140	17021 CAPTIVA DR CAPTIVA FL 33924	MCDOWELL NORMAN	P O BOX 104	CAPTIVA FL 33924
11-46-21-00-00017.0150	17001 CAPTIVA DR CAPTIVA FL 33924	HARRIS AVENUE HOLDINGS LLC	315 HARRIS AVE	CLARENDON HILLS IL 60514
11-46-21-00-00017.0170	17081 CAPTIVA DR CAPTIVA FL 33924	MIVILLE RENE + MARGARETHE THYE	PO BOX 9	CAPTIVA FL 33924
11-46-21-00-00017.0180	17061 CAPTIVA DR CAPTIVA FL 33924	HOLLEY PARTNERS	213 WEST INSTITUTE PL SUITE 403	CHICAGO IL 60610
11-46-21-00-00017.0200	17140 CAPTIVA DR CAPTIVA FL 33924	MOBED DARAYES + GOHER D	RD#3 BOX 532 RESERVOIR RD	GOSHEN NY 10924
11-46-21-00-00017.0220	17141 CAPTIVA DR CAPTIVA FL 33924	MOBED DARAYES + GOHER D	2 RESERVOIR RD	GOSHEN NY 10924
11-46-21-T4-00001.0010	17200 CAPTIVA DR CAPTIVA FL 33924	LEE COUNTY	PO BOX 398	FORT MYERS, FL 33902

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-T1-00002.0000	ALBRIGHT ISLAND SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957
02-46-21-T3-00019.0000	ALBRIGHT ISLAND SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957
02-46-21-00-00018.0000	GOVT LOT SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957
02-46-21-T3-00020.0000	RUNYON KEY SANIBEL FL 33957	U S FISH + WILDLIFE SERVICES	75 SPRING ST SW STE 1240	ATLANTA GA 30303
14-46-21-T2-00002.0000	ACCESS UNDETERMINED SANIBEL FL 33957	LEE COUNTY	P O BOX 398	FORT MYERS FL 33902
02-46-21-00-00017.007B	16989 CAPTIVA DR CAPTIVA FL 33924	DUNBAR FLORIDA REALTY	4350 BROWNSBORO RD STE 310	LOUISVILLE KY 40207
02-46-21-00-00017.007A	16979 CAPTIVA DR CAPTIVA FL 33924	CADMAN TIMOTHY + JEAN	P O BOX 728	CAPTIVA FL 33924
02-46-21-00-00017.0070	16969 CAPTIVA DR CAPTIVA FL 33924	THYE-MIVILLE MARGARETHE + MIVILLE RENE ANDRE W/H	BOX 9	CAPTIVA FL 33924
02-46-21-00-00017.0020	16915 CAPTIVA DR CAPTIVA FL 33924	SCHUBERT JOHN D + DONNA J	16897 CAPTIVA DR	CAPTIVA FL 33924
02-46-21-00-00017.0030	16897 CAPTIVA DR CAPTIVA FL 33924	SCHUBERT JOHN D + DONNA J	PO BOX 696	CAPTIVA FL 33924
02-46-21-00-00017.0040	16891 CAPTIVA DR CAPTIVA FL 33924	SCHIBILIA JUNE P + PITHA PATRICIA A	30 POINT MOUNTAIN RD	WASHINGTON NJ 07882
02-46-21-00-00017.0060	16879 CAPTIVA DR CAPTIVA FL 33924	MELIX CORP	P O BOX 8800	WINDERMERE FL 34786

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-T1-0010B.0070	6498 SANIBEL CAPTIVA RD SANIBEL FL 33957	TOMITA TADANORI	1410 BURR OAK DR	GLENVIEW IL 60025
11-46-21-T1-0010B.0060	SANIBEL CAPTIVA RD SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T1-0010B.0050	6491 SANIBEL CAPTIVA RD SANIBEL FL 33957	L C T PROPERTIES INC	6520-A PINE AV	SANIBEL FL 33957
11-46-21-T1-0010B.0040	6487 SANIBEL CAPTIVA RD SANIBEL FL 33957	ROCHESTER RESORTS INC	6486 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-0010B.0010	6477 SANIBEL CAPTIVA RD SANIBEL FL 33957	PALMER ROXANNE	15660 LAKE CANDLEWOOD DR	FORT MYERS FL 33908
11-46-21-T1-0010B.001A	6467 SANIBEL CAPTIVA RD SANIBEL FL 33957	ROCHESTER RESORTS INC	CASTAWAYS 6460 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-0010A.0000	6467 SANIBEL CAPTIVA RD SANIBEL FL 33957	ROCHESTER RESORTS INC	CASTAWAYS 6460 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-0010A.0100	6459 SANIBEL CAPTIVA RD SANIBEL FL 33957	ROCHESTER RESORTS INC	CASTAWAYS 6460 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-0010A.0070	6455 SANIBEL CAPTIVA RD SANIBEL FL 33957	ROCHESTER RESORTS INC	CASTAWAYS 6460 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-0010A.0060	6451 SANIBEL CAPTIVA RD SANIBEL FL 33957	ROCHESTER RESORTS INC	CASTAWAYS 6460 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-0010A.0050	6447 SANIBEL CAPTIVA RD SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-T1-0010A.0020	6437 SANIBEL CAPTIVA RD SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957
11-46-21-T1-0010A.0010	SANIBEL CAPTIVA RD SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957
11-46-21-T1-00010.0050	6425 SANIBEL CAPTIVA RD SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T1-00010.0060	6415 SANIBEL CAPTIVA RD SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T1-00010.0070	6399 SANIBEL CAPTIVA RD SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T1-00010.0080	6385 SANIBEL CAPTIVA RD SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T1-00010.0100	6371 SANIBEL CAPTIVA RD SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T1-00010.0110	6351 SANIBEL CAPTIVA RD SANIBEL FL 33957	BEGRAFT BONNIE A + BEGRAFT DONALD F FOR BONNIE BEGRAFT TRUST	6351 SANIBEL CAPTIVA RD	SANIBEL FL 33957
11-46-21-T1-00010.0130	6161 SANIBEL CAPTIVA RD SANIBEL FL 33957	SCRIBANTE A J CO TR + SCRIBANTE LYNDA KAY HARE CO TR FOR A J + L K H SCRIBANTE REV TRUST	7007 SOUTH 109TH ST	OMAHA NE 68128

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-T1-00010.0120	6111 SANIBEL CAPTIVA RD SANIBEL FL 33957	SCRIBANTE A J TR + SCRIBANTE LYNDA KAY HARE TR FOR A J + LINDA KAY HHARE SCRIBANTE TRUST	7007 SOUTH 109TH ST	OMAHA NE 68128
11-46-21-T1-00010.0000	SANIBEL CAPTIVA RD SANIBEL FL 33957	SCRIBANTE A J TR + SCRIBANTE LYNDA KAY HARE TR FOR A J + LINDA KAY HHARE SCRIBANTE TRUST	7007 SOUTH 109TH ST	OMAHA NE 68128
11-46-21-T1-00010.0150	SANIBEL CAPTIVA RD SANIBEL FL 33957	SCRIBANTE A J TR + SCRIBANTE LYNDA KAY HARE TR FOR A J + LINDA KAY HHARE SCRIBANTE TRUST	7007 SOUTH 109TH ST	OMAHA NE 68128
11-46-21-T1-00010.014A	SANIBEL CAPTIVA RD SANIBEL FL 33957	SCRIBANTE A J TR + SCRIBANTE LYNDA KAY HARE TR FOR A J + LINDA KAY HHARE SCRIBANTE TRUST	7007 SOUTH 109TH ST	OMAHA NE 68128
11-46-21-T1-00010.0140	6089 SANIBEL CAPTIVA RD SANIBEL FL 33957	SCRIBANTE A J TR + SCRIBANTE LYNDA KAY HARE TR FOR A J + LINDA KAY HHARE SCRIBANTE TRUST	7007 SOUTH 109TH ST	OMAHA NE 68128

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-T3-00014.0000	SILVER KEY SANIBEL FL 33957	CITY OF SANIBEL	800 DUNLOP RD	SANIBEL FL 33957
11-46-21-T4-00005.0000	ACCESS UNDETERMINED SANIBEL FL 33957	LEE COUNTY	PO BOX 398	FORT MYERS FL 33902

Attachment #16

Adjacent Properties

Strap	Location/Address	Owner	Owner Address	City, State, Zip
11-46-21-00-00017.0080	17201 CAPTIVA DR CAPTIVA FL 33924	MADDEN MARJORIE	P O BOX 305	CAPTIVA, FL 33924
11-46-21-00-00017.0090	17181 CAPTIVA DR CAPTIVA FL 33924	SHEETZ CHARLES H + GAIL R	PO BOX 131	CAPTIVA FL 33924
11-46-21-00-00017.0100	17171 CAPTIVA DR CAPTIVA FL 33924	MULLINS MICHAEL C + CANNELLA C	PO BOX 880	CAPTIVA FL 33924
11-46-21-00-00017.010A	17170 CAPTIVA DR CAPTIVA FL 33924	MULLINS MICHAEL C + CANNELLA C	PO BOX 880	CAPTIVA FL 33924
11-46-21-00-00017.0110	17130 CAPTIVA DR CAPTIVA FL 33924	DUVAL FRANK E + JEANNINE F	4557 CROSSFIELDS RD	TOLEDO OH 43623
11-46-21-00-00017.011A	17121 CAPTIVA DR CAPTIVA FL 33924	WILLIAMS THOMAS W	P O BOX 1088	CAPTIVA FL 33924
11-46-21-00-00017.012A	17101 CAPTIVA DR CAPTIVA FL 33924	COURTER JAMES A + CARMEN M	17 MOCKINGBIRD	HACKETTSTOWN NJ 07840
11-46-21-00-00017.0130	17041 CAPTIVA DR CAPTIVA FL 33924	WILSON RODNEY M + WILSON JENIFER A	17041 CAPTIVA DR	CAPTIVA FL 33924
11-46-21-00-00017.0140	17021 CAPTIVA DR CAPTIVA FL 33924	MCDOWELL NORMAN	P O BOX 104	CAPTIVA FL 33924
11-46-21-00-00017.0150	17001 CAPTIVA DR CAPTIVA FL 33924	HARRIS AVENUE HOLDINGS LLC	315 HARRIS AVE	CLARENDON HILLS IL 60514
11-46-21-00-00017.0170	17081 CAPTIVA DR CAPTIVA FL 33924	MIVILLE RENE + MARGARETHE THYE	PO BOX 9	CAPTIVA FL 33924
11-46-21-00-00017.0180	17061 CAPTIVA DR CAPTIVA FL 33924	HOLLEY PARTNERS	213 WEST INSTITUTE PL SUITE 403	CHICAGO IL 60610
11-46-21-00-00017.0200	17140 CAPTIVA DR CAPTIVA FL 33924	MOBED DARAYES + GOHER D	RD#3 BOX 532 RESERVOIR RD	GOSHEN NY 10924
11-46-21-00-00017.0220	17141 CAPTIVA DR CAPTIVA FL 33924	MOBED DARAYES + GOHER D	2 RESERVOIR RD	GOSHEN NY 10924

Strap	Location/Address	Owner	Owner Address	City, State, Zip
02-46-21-00-00018.0000	GOVT LOT SANIBEL FL 33957	SANIBEL-CAPTIVA CONSERVATION FOUNDATION INC	PO BOX 839	SANIBEL FL 33957
02-46-21-00-00017.007B	16989 CAPTIVA DR CAPTIVA FL 33924	DUNBAR FLORIDA REALTY	4350 BROWNSBORO RD STE 310	LOUISVILLE KY 40207
02-46-21-00-00017.007A	16979 CAPTIVA DR CAPTIVA FL 33924	CADMAN TIMOTHY + JEAN	P O BOX 728	CAPTIVA FL 33924
02-46-21-00-00017.0070	16969 CAPTIVA DR CAPTIVA FL 33924	THYE-MIVILLE MARGARETHE + MIVILLE RENE ANDRE W/H	BOX 9	CAPTIVA FL 33924
02-46-21-00-00017.0020	16915 CAPTIVA DR CAPTIVA FL 33924	SCHUBERT JOHN D + DONNA J	16897 CAPTIVA DR	CAPTIVA FL 33924
02-46-21-00-00017.0030	16897 CAPTIVA DR CAPTIVA FL 33924	SCHUBERT JOHN D + DONNA J	PO BOX 696	CAPTIVA FL 33924
02-46-21-00-00017.0040	16891 CAPTIVA DR CAPTIVA FL 33924	SCHIBILIA JUNE P + PITHA PATRICIA A	30 POINT MOUNTAIN RD	WASHINGTON NJ 07882
02-46-21-00-00017.0060	16879 CAPTIVA DR CAPTIVA FL 33924	MELIX CORP	P O BOX 8800	WINDERMERE FL 34786

Department of

Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399-3000
MS 105

Colleen Castille
Secretary

Mean High Water Procedure Approval

Date: February 7, 2006

Name: ___Erickson Consulting Engineers, Inc._____

Address: _1819_Main_Street_Suite_#402,_Saraosta,_FL34236___

Phone: __941-952-0487___ County: __Sarasota _____

Point Identification Number: 100210

Mean High Water (MHW) : 0.28 ft Mean Low Water (MLW): -1.51 ft

Datum: NAVD 1988 Unit of Measurement: Feet

Tidal Epoch: 1983-2001

Procedure: Extend the above MHW height onto job site.

Source of Data: The Land Boundary Information System internet web site (www.labins.org)

This form constitutes approval of the method to be used to survey the mean high water line within one half mile of the point identified above.

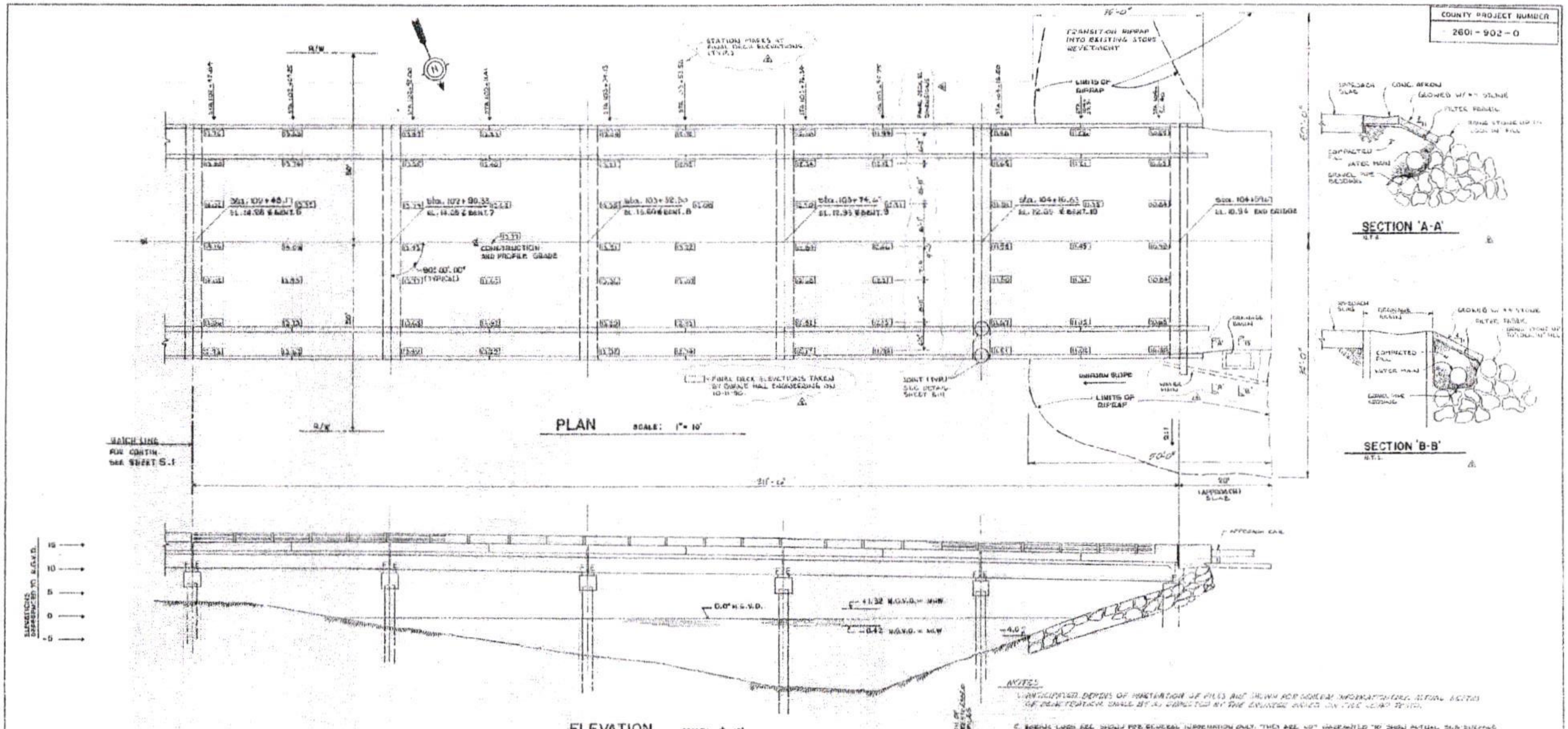
Retain this form for record keeping. Submit a copy of it with the completed survey to the Bureau of Survey and Mapping within 90 days of the completion of the survey.

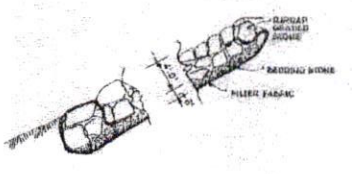
Contact:

Division of State Lands
Bureau of Surveying and Mapping
(850)245-2606

Attachment #23

As-built Drawings for Existing Structures (Blind Pass Bridge)





TYPICAL RIPRAP ABUTMENT PROTECTION

N.T.S.

APPROXIMATE BORING LOCATIONS

B1 - STA 100+15 35 FT RT

B3 - STA 104+60 35 FT LT

NOTES

1. ANTICIPATED DEPTHS OF PENETRATION OF PILES ARE SHOWN FOR GENERAL INFORMATION ONLY. ACTUAL DEPTHS OF PENETRATION SHALL BE AS DIRECTED BY THE ENGINEER BASED ON PILE LOAD TESTS.

2. BORING LOGS ARE SHOWN FOR GENERAL INFORMATION ONLY. THEY ARE NOT WARRANTED TO SHOW ACTUAL SUB-SURFACE CONDITIONS. THEY ARE SPECIFICALLY NOT INCLUDED IN THE CONTRACTOR'S CONTRACT WITH LEE COUNTY.

BORING LOG

B-1 (SEE LOCATION ON SHEET R-4)

DEPTH FT ELEV 3.0	BLOWS PER FOOT	SOIL PROFILE
	6	LOOSE BROWN FINE SAND, SOME SHELL FRAGMENTS
5	15	FIRM GRAY FINE SAND AND SHELL FRAGMENTS
10	7	LOOSE GRAY SLIGHTLY SILTY FINE SAND W/ TRACE SHELL FRAGMENTS
15	7	LOOSE GRAY FINE SAND AND SHELL FRAGMENTS
25–30	5	LOOSE TO VERY LOOSE GRAY SILTY FINE SAND TRACE SHELL FRAGMENTS
	40	MEDIUM HARD DRILLING
	15	FIRM GRAYISH WHITE CEMENTED SAND

40 FT.

DEPTH FT	BLOWS PER FOOT	SOIL PROFILE
		HARD SHELL, SOME LIMESTONE FRAGMENTS
45	10	LOOSE GRAY FINE SAND - SOME SHELL FRAGMENTS
	62	HARD DRILLING REPORTED
	8	EASIER DRILLING REPORTED
55	8	HARD LIMESTONE FRAGMENTS RECOVERED
	8	EASIER DRILLING REPORTED
60	13	MED HARD GRAY SLIGHTLY SILTY FINE SAND
	75	HARD DRILLING REPORTED
65	8	VERY LOOSE TO LOOSE GRAY SLIGHTLY SILTY FINE SAND, SOME LIMESTONE FRAGMENTS
70		BORING TERMINATED

80 FT.

B-3 (SEE LOCATION ON SHEET R-4)

DEPTH FT ELEV 6.0	BLOWS PER FOOT	SOIL PROFILE
	5	GREY FINE SAND, SOME SHELL FRAGMENTS
5	25	VERY FIRM TAN TO BROWN FINE SAND TRACE SHELL FRAGMENTS
10–20	9	FIRM TO LOOSE GRAY FINE SAND SHELL FRAGMENTS
25	19	FIRM GRAY SLIGHTLY SILTY FINE SAND, SHELL FRAGMENTS
30	5	LOOSE GRAY SILTY SAND SOME SHELL FRAGMENTS
35	9	LOOSE GRAY FINE SAND SOME FRAGMENTS, CEMENTED SHELL

40 FT.

DEPTH FT	BLOWS PER FOOT	SOIL PROFILE
	9	LOOSE GRAY FINE SAND W/ SOME FRAGMENTS AND CEMENTED SHELL
45–50	15	FIRM LIGHT GRAY CALCAREOUS CEMENTED SLIGHTLY SILTY FINE SAND AND SHELL
55–60	50 @ 5" 50 @ 2"	VERY DENSE GRAY CEMENTED SAND AND SHELL
65	15	FIRM GRAY VERY SILTY FINE SAND & SHELL
		BORING TERMINATED

80 FT.

* THE NUMBER OF BLOWS OF 140 lb HAMMER FALLING 30" REQUIRED TO DRIVE 1.4" I.D. SAMPLER 1 FOOT.

NOTE: GEOTECHNICAL INVESTIGATION PERFORMED BY LAW ENGINEERING PROJECT NO. TE 5431 ON 7/27, 30/86 AND 8/5, 4/86.

REVISIONS DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
1	CBC	RECORD DRAWINGS			

	NAME	DATE		NAME	DATE
DESIGNED BY	E.L.O.	11-2-86	DRAWN BY	EGS	11-10-86
CHECKED BY	FEC	12-86	CHECKED BY	ELO	12-86

JENKINS & CHARLAND INCORPORATED Consulting Engineers

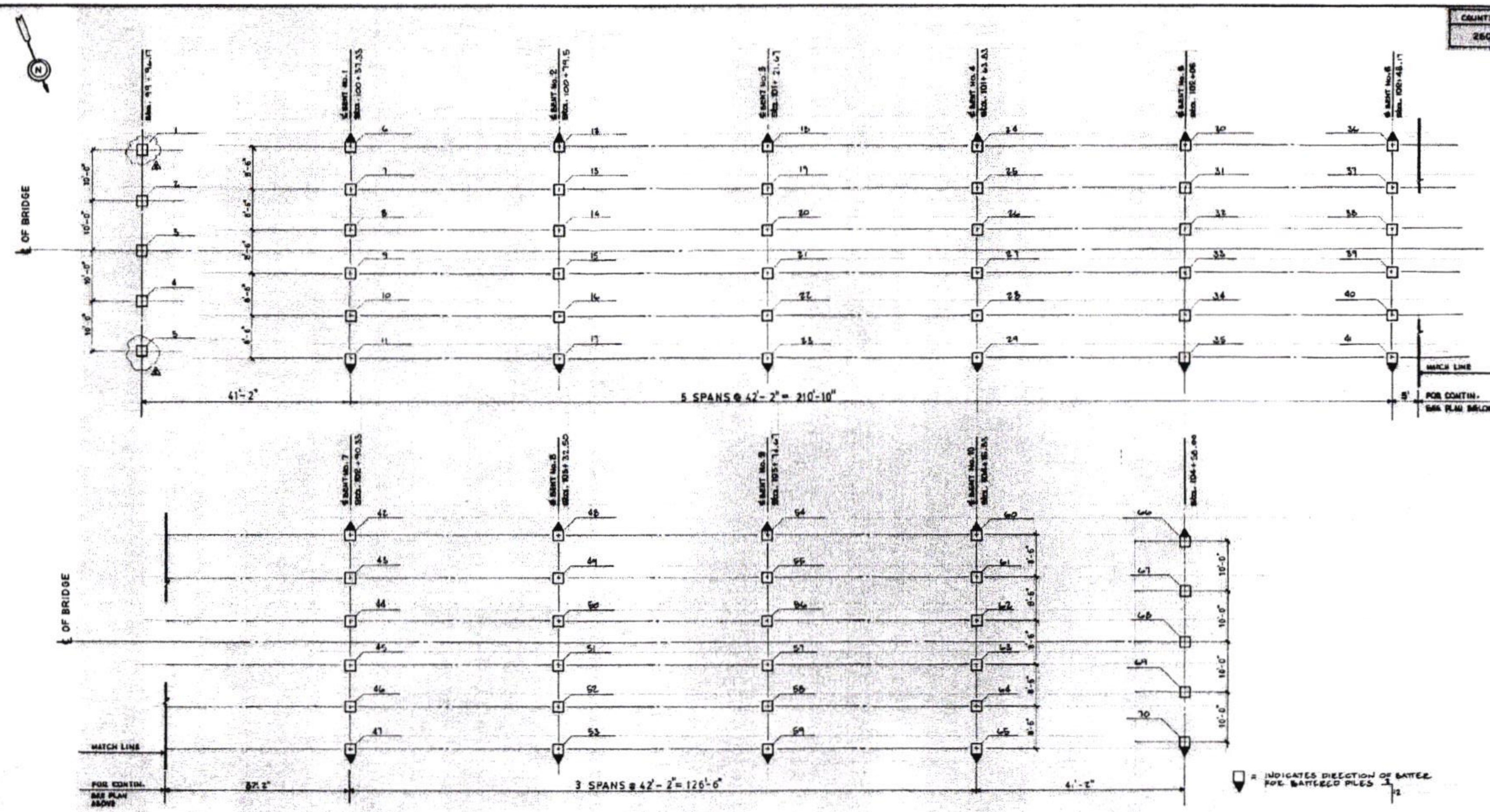
LEE COUNTY DEPARTMENT OF TRANSPORTATION AND ENGINEERING

BLIND PASS BRIDGE REPLACEMENT

PLAN AND ELEVATION

85-504

SHEET NO. B-2



PILING PLAN SCALE: 1"=10'

NOTES:

1. PILES SHALL BE DRIVEN TO A CAPACITY OF 70 TONS AS DETERMINED BY THE ENGINEER USING ON-SITE PILE DRIVING ANALYZER (PDA). CONTRACTOR SHALL COOPERATE WITH ENGINEER IN INSTRUMENTATION AND SET-UP. SIX PILES SHALL BE TESTED AS DIRECTED BY THE ENGINEER.

2. PILING SHALL BE DRIVEN DURING PERIODS OF MODERATE TO LOW TIDAL RANGES AND WAVE ACTIVITY. WORK AREAS SHALL BE ENCIRCLED WITH TURBIDITY SCREENS AND WHEN POSSIBLE ALL WORK SHALL BE PERFORMED DURING AN EBB TIDE. EXTRA CARE SHALL BE TAKEN TO INSURE THAT TURBID WATER DOES NOT IMPACT THE BACK BAY SYSTEM. THESE REQUIREMENTS ARE INCIDENTAL TO ITEM 455-6, PRESTRESSED CONCRETE PILING DRIVING, AND NOT ELIGIBLE FOR SEPARATE PAYMENT.

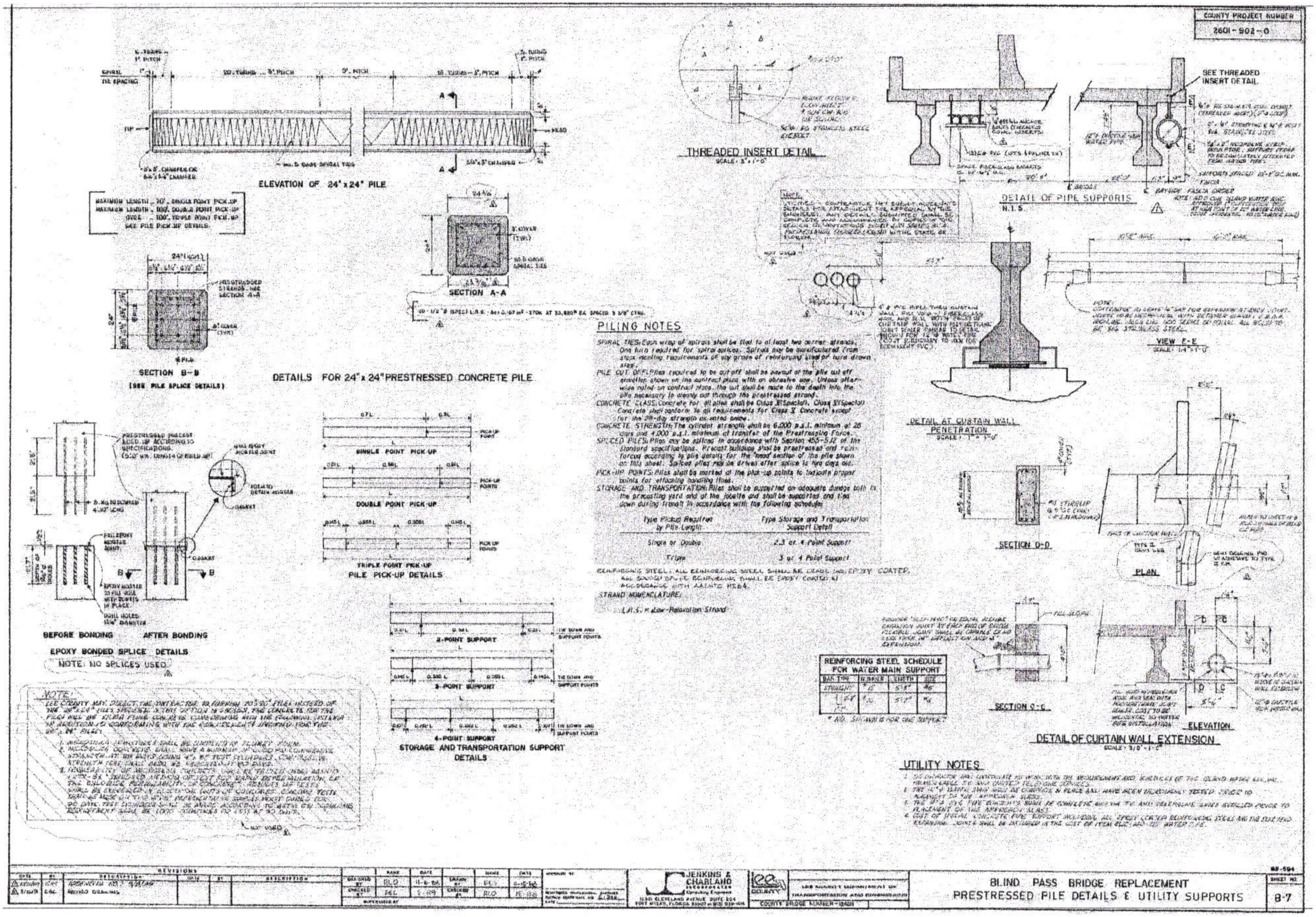
DESIGNED BY	E.L.G.	11-5-88	DRAWN BY	EEG	11-30-86	
CHECKED BY	PEC	2-89	CHECKED BY	RLO	12-86	

JENKINS & CHARLAND INCORPORATED Consulting Engineers
1530 CLEVELAND AVENUE SUITE 204 FORT MYERS, FLORIDA

LEE COUNTY DEPARTMENT OF TRANSPORTATION AND ENGINEERING

COUNTY BRIDGE NUMBER

BLIND PASS BRIDGE REPLACEMENT
PILING PLAN



PILING NOTES

SPIRAL TIES: Each wrap of spirals shall be tied to at least two corner strands. One turn required for spiral splices. Spirals may be manufactured from steel meeting requirements of any grade of reinforcing steel or hard drawn steel.

PILE CUT OFF: Piles required to be cut off shall be sawcut at the pile cut off elevation shown on the contract plans with an abrasive saw. Unless otherwise noted on contract plans, the cut shall be made to the depth into the pile necessary to cleanly cut through the prestressed strand.

CONCRETE CLASS: Concrete for all piles shall be Class II (Special). Class II (Special) Concrete shall conform to all requirements for Class II Concrete except for the 28-day strength as noted below.

CONCRETE STRENGTH: The cylinder strength shall be 6,000 p.s.i. minimum at 28 days and 4,000 p.s.i. minimum at transfer of the Prestressing Force.

SPLICED PILES: Piles may be spliced in accordance with Section 455-5.12 of the Standard specifications. Precast buildups shall be prestressed and reinforced according to pile details for the "head" section of the pile shown on this sheet. Spliced piles may be driven after splice is two days old.

PICK-UP POINTS: Piles shall be marked at the pick-up points to indicate proper points for attaching handling lines.

STORAGE AND TRANSPORTATION: Piles shall be supported on adequate dunnage both in the precasting yard and at the jobsite and shall be supported and tied down during transit in accordance with the following schedule:

Type Pickup Required by Pile Length	Type Storage and Transportation Support Detail
Single or Double	2,3 or 4 Point Support
Triple	3 or 4 Point Support

REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE GRADE 60, EPOXY COATED. ALL DOWEL SPLICE REINFORCING SHALL BE EPOXY COATED IN ACCORDANCE WITH AASHTO M284.

STRAND NOMENCLATURE:

L.R.S. = Low-Relaxation Strand

REINFORCING STEEL SCHEDULE FOR WATER MAIN SUPPORT			
BAR TYPE	NUMBER	LENGTH	SIZE
STRAIGHT	*15	5'-5"	#6
[illegible]	*10	5'-7"	#4

* NO. SHOWN IS FOR ONE SUPPORT

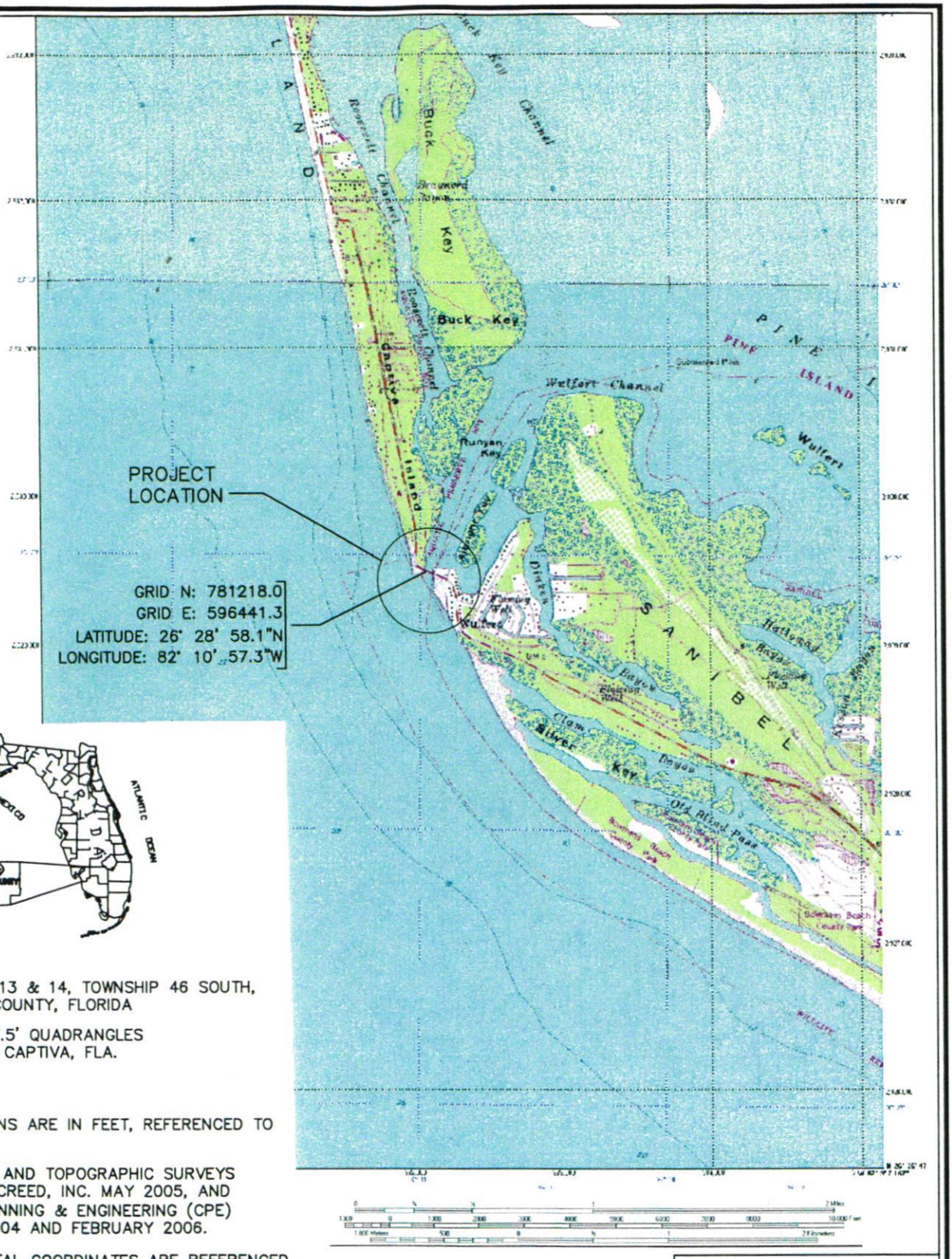
JENKINS & CHARLAND INCORPORATED Consulting Engineers
1220 CLEVELAND AVENUE SUITE 204 FORT MYERS, FLORIDA 33907

LEE COUNTY

COUNTY BRIDGE NUMBER - 124011

BLIND PASS BRIDGE REPLACEMENT
PRESTRESSED PILE DETAILS & UTILITY SUPPORTS

SHEET NO. B-7



SECTIONS 2, 11, 13 & 14, TOWNSHIP 46 SOUTH, RANGE 21, LEE COUNTY, FLORIDA

SOURCE: USGS 7.5' QUADRANGLES WULFERT, FLA & CAPTIVA, FLA.

NOTES:

1. ALL ELEVATIONS ARE IN FEET, REFERENCED TO NAVD 1988.
2. BATHYMETRIC AND TOPOGRAPHIC SURVEYS BY McKIM & CREED, INC. MAY 2005, AND COASTAL PLANNING & ENGINEERING (CPE) NOVEMBER 2004 AND FEBRUARY 2006.
3. ALL HORIZONTAL COORDINATES ARE REFERENCED TO NORTH AMERICAN DATUM OF 1983, FLORIDA STATE PLANE, WEST ZONE.
4. AERIAL PHOTOGRAPHY PROVIDED BY LEE COUNTY, FLOWN JANUARY 2005.

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

H:\CAD\...s\Blind Pass Restoration\Planning & Permiting\Preferred Design\05-12...Location.dwg 5/1/2006 4:10:42 PM EDT

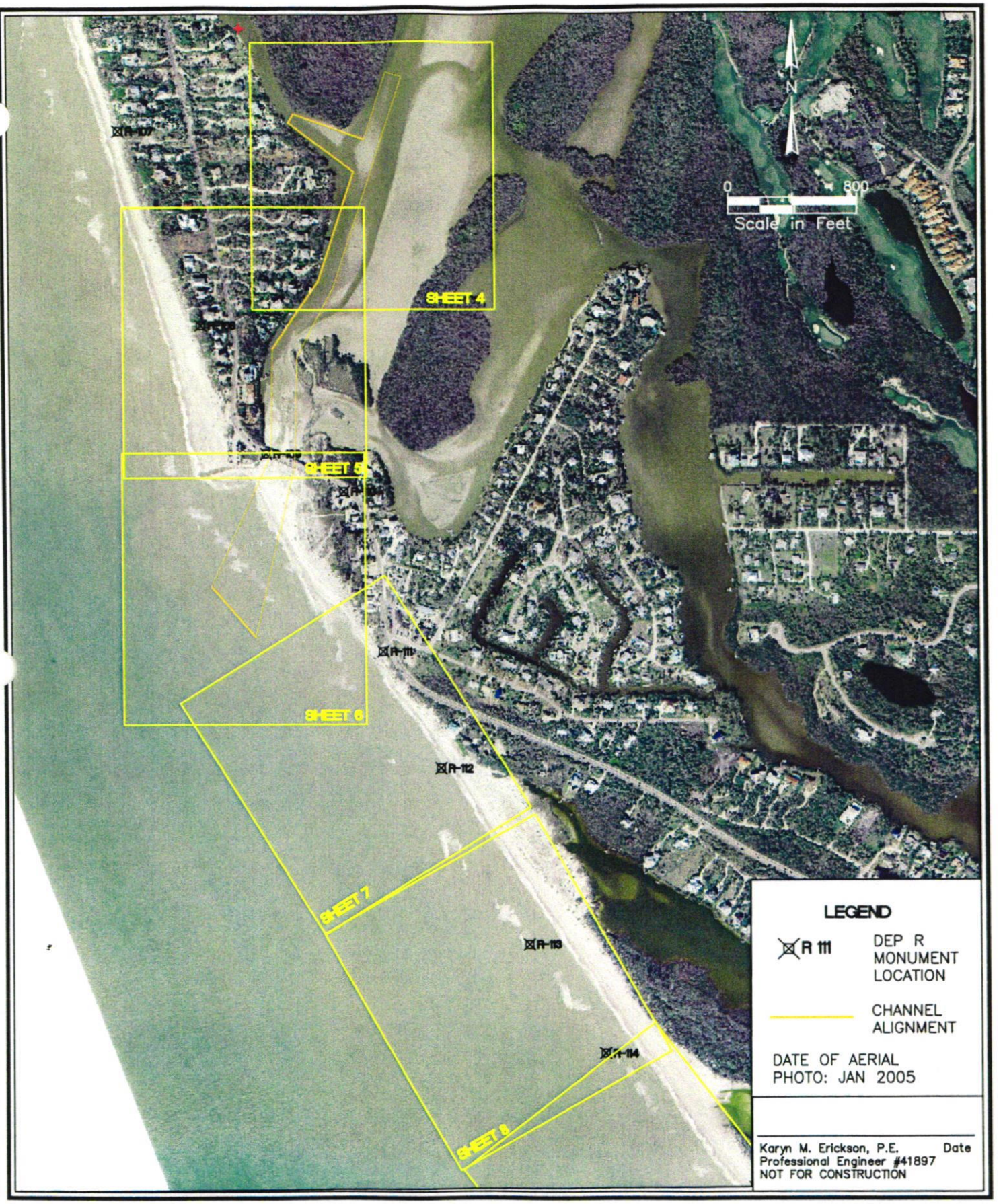
ECE
Erickson Consulting Engineers
1819 Main St., Suite 402
Sarasota, FL 34236
(941) 952-0487

SITE LOCATION MAP

BLIND PASS RESTORATION
Lee County, Florida

REVISIONS

PROJECT 05-129	CHECKED BY WJ
DATE 01/26/06	DRAWN BY JE
SCALE As Shown	SHEET: 1 of 31



LEGEND

R 111 — DEP R MONUMENT LOCATION

CHANNEL ALIGNMENT

DATE OF AERIAL PHOTO: JAN 2005

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

ECE
Erickson Consulting Engineers
1819 Main St., Suite 402
Sarasota, FL 34236
(941) 952-0487

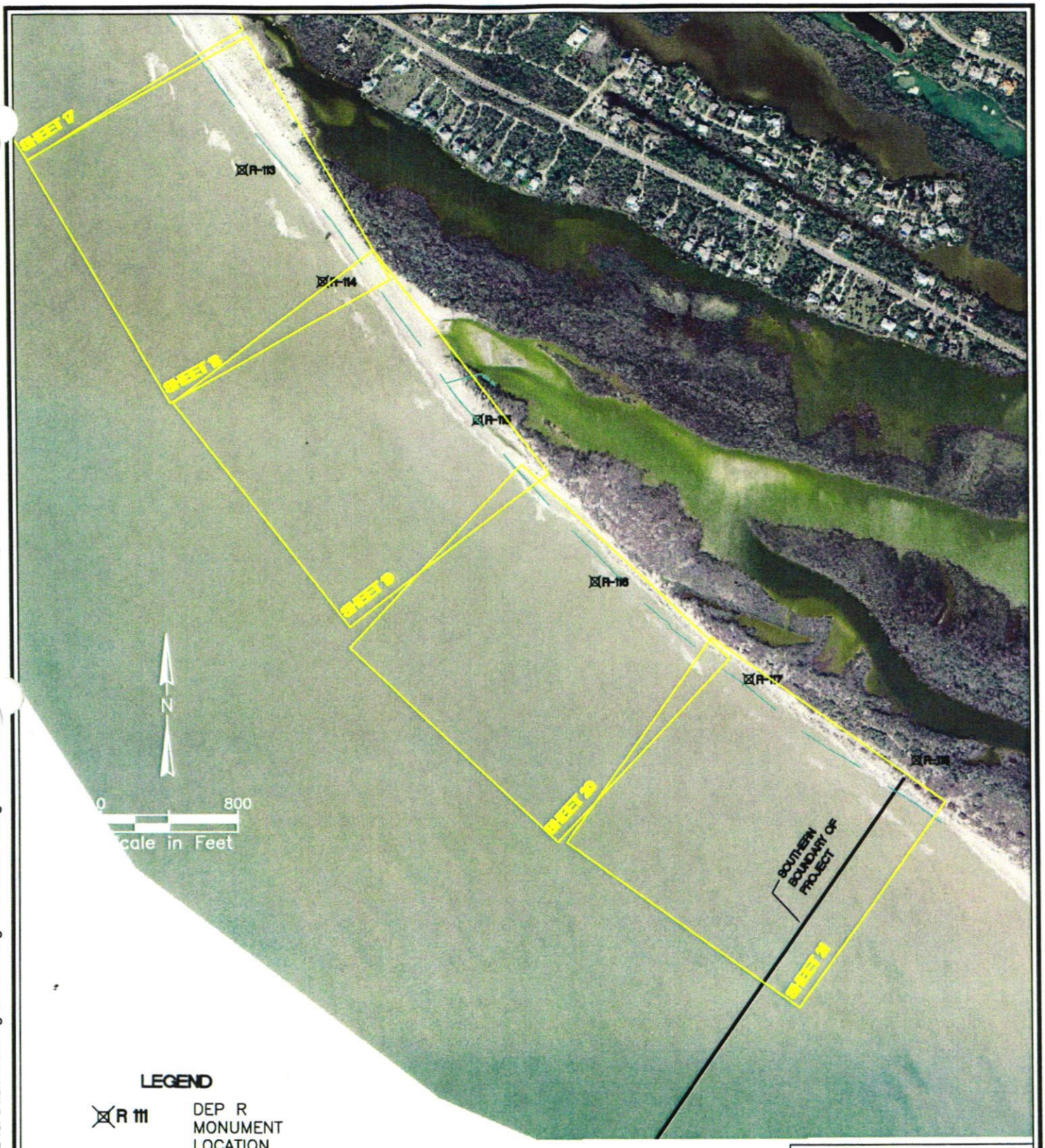
PLAN VIEW – EXISTING CONDITIONS
SHEET INDEX

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 01/12/09	DRAWN BY JE
SCALE 1"=800'	SHEET: 2 of 31

H:\CADD_\Blind Pass Restoration\Planning & Permiting\Preferred Design\05-129 ... w Preferred Design.dwg 5/1/2006 4:18:16 PM EDT



LEGEND

R 111 — DEP R MONUMENT LOCATION

DATE OF AERIAL PHOTO: JAN 2005

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

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Erickson Consulting Engineers
1819 Main St., Suite 402
Sarasota, FL 34236
(941) 952-0487

PLAN VIEW
SHEET INDEX

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/27/06	DRAWN BY JE
SCALE 1"=800'	SHEET: 3 of 31

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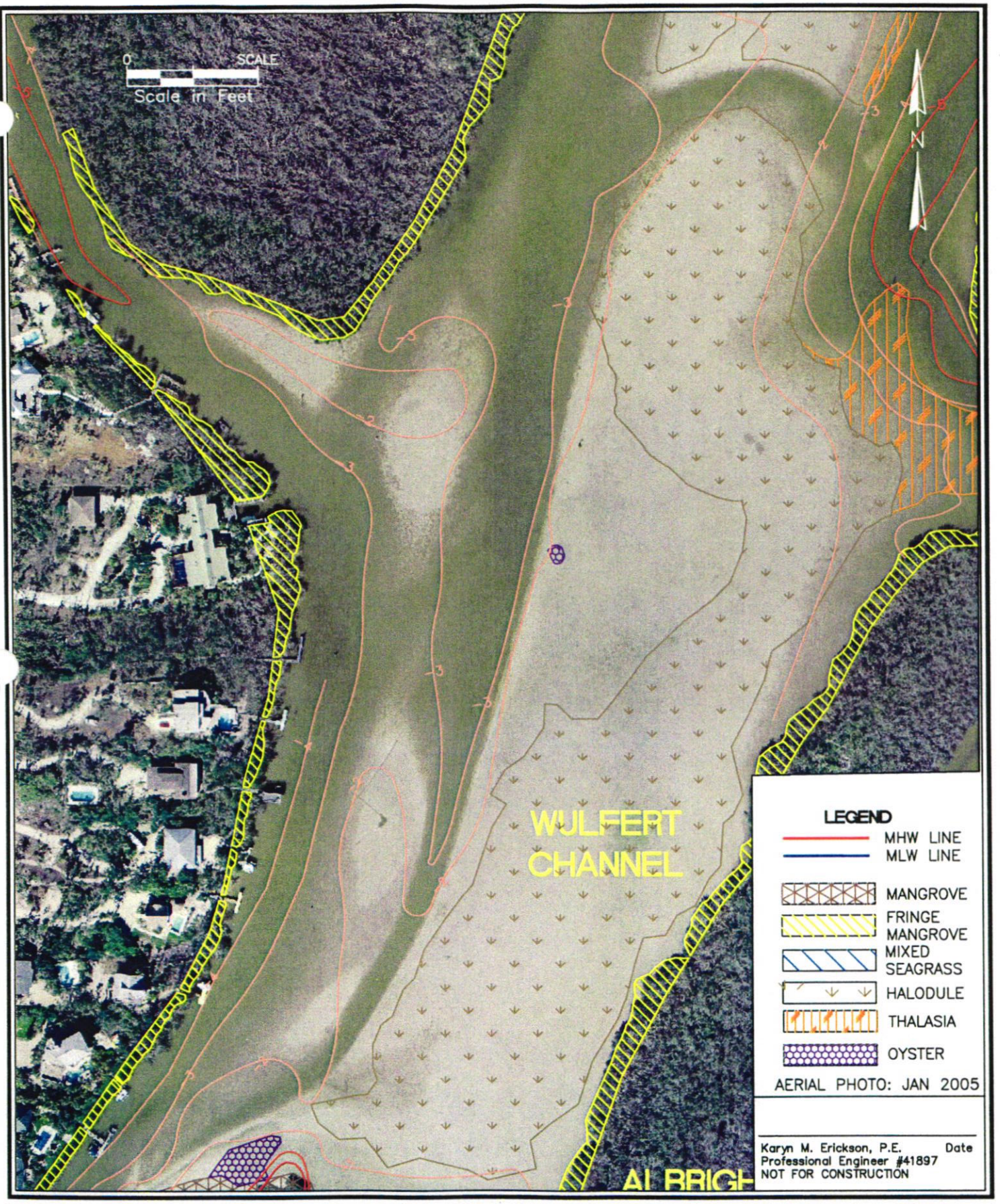

Karyn M. Erickson, P.E. Date
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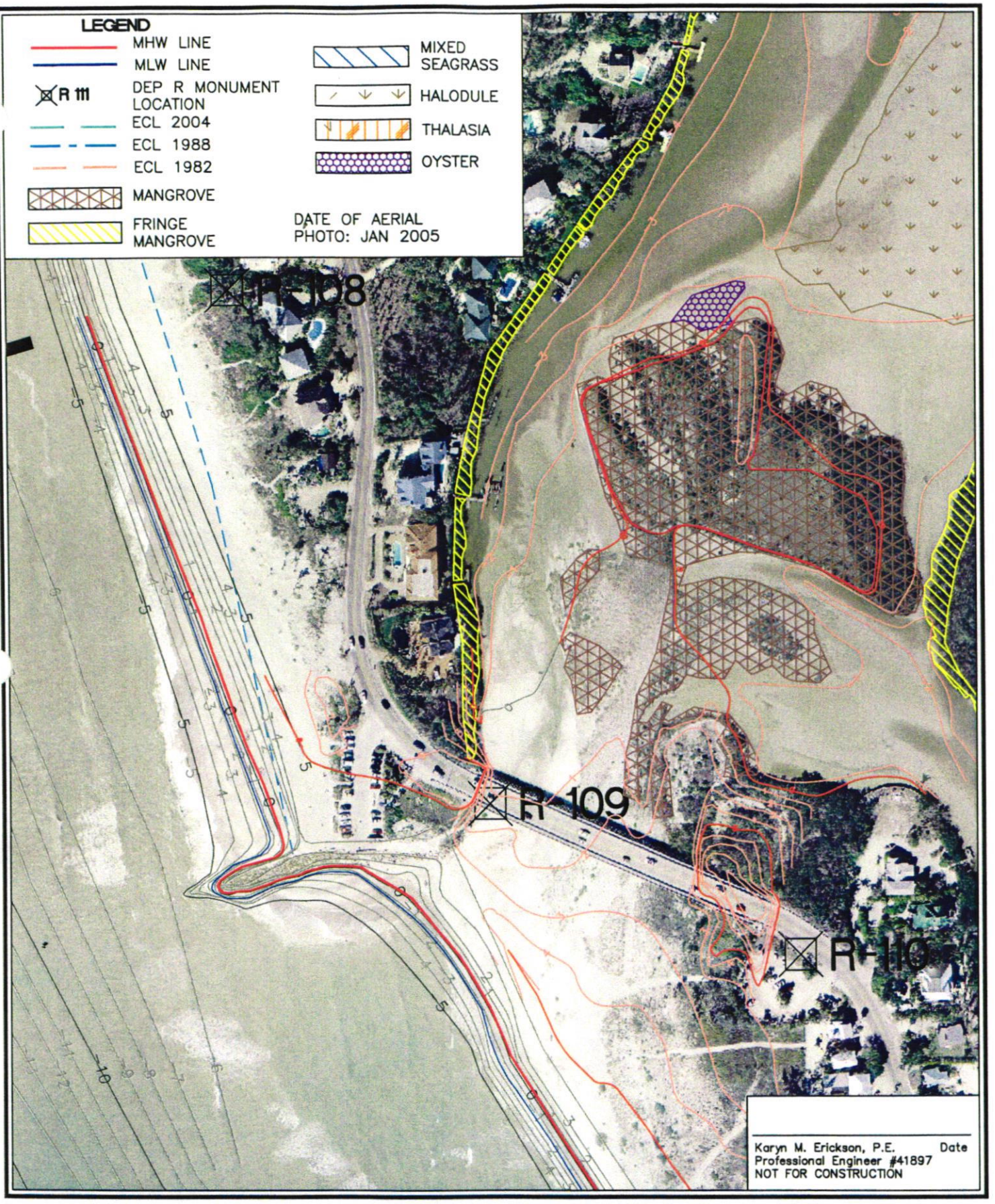
PLAN VIEW – EXISTING CONDITIONS
CHANNEL ALIGNMENT

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/8/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 4 of 31



Karyn M. Erickson, P.E. Date
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\Blind Pass Restoration\Planning & Permiting\Preferred Design\05-129 w Preferred Design.dwg 5/1/2006 42434 PM EDT

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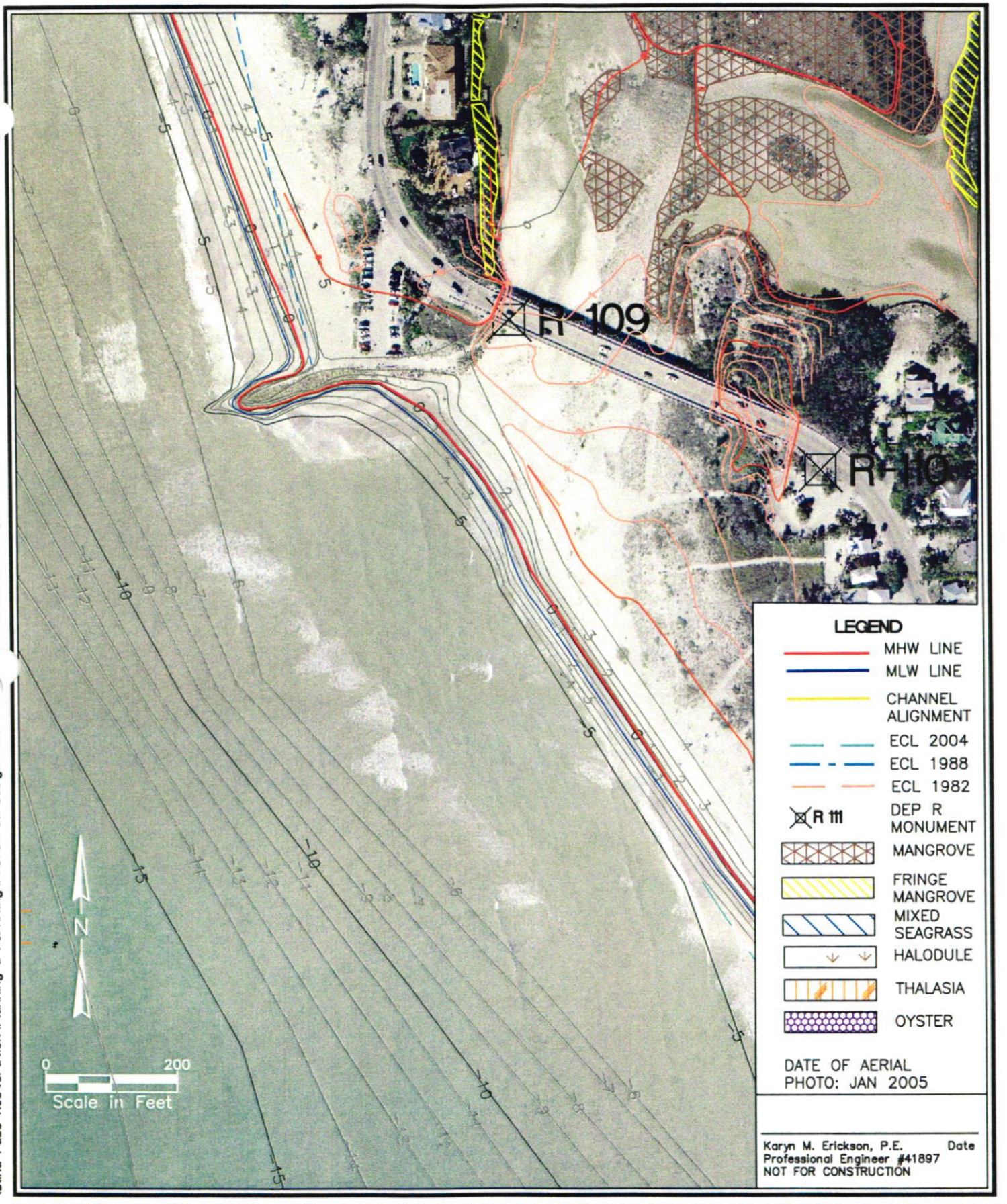
PLAN VIEW – EXISTING CONDITIONS
CHANNEL ALIGNMENT

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 5 of 31



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PLAN VIEW – EXISTING CONDITIONS
CHANNEL ALIGNMENT

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 6 of 31

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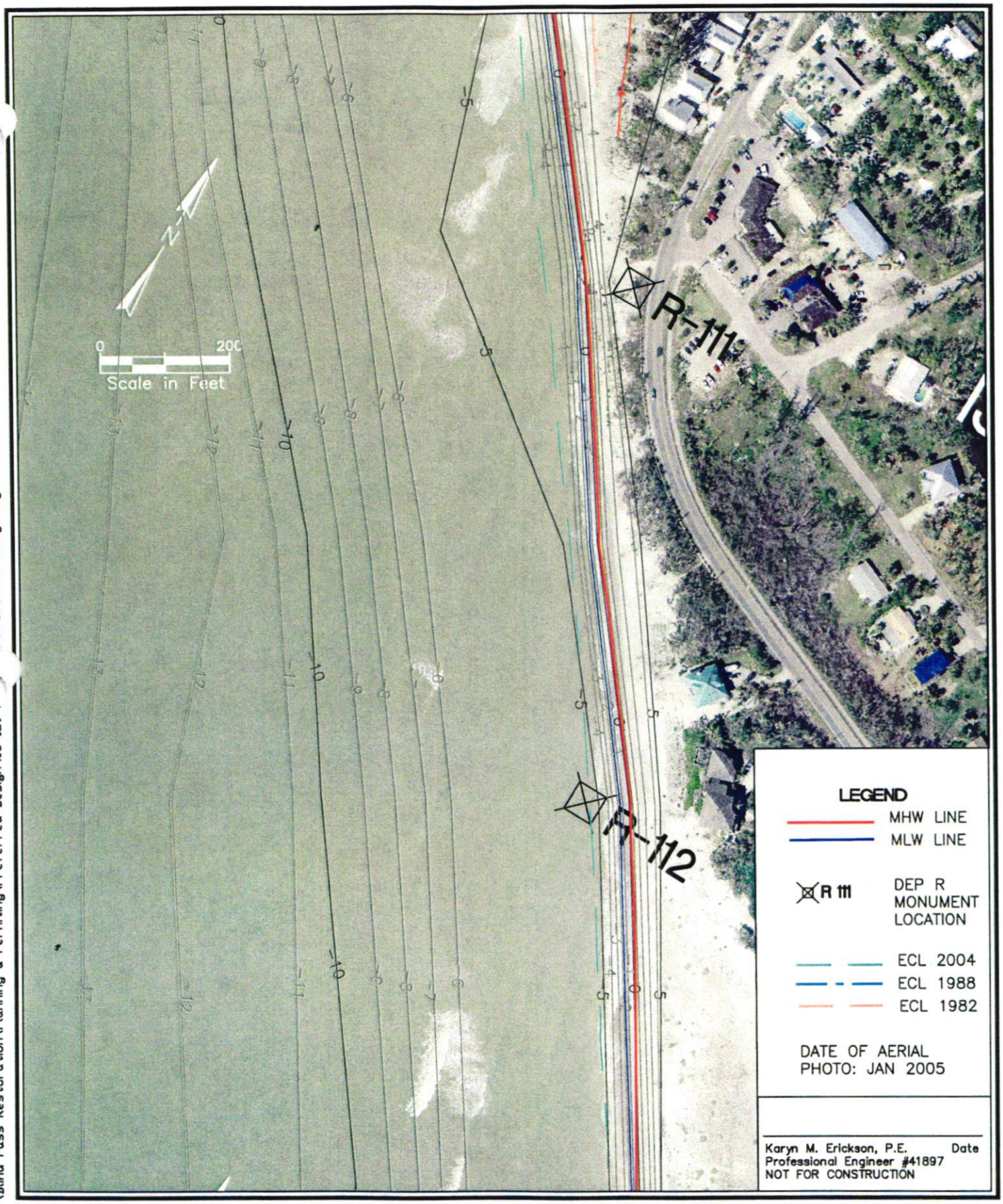

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PLAN VIEW – EXISTING CONDITIONS
POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 7 of 31

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PLAN VIEW – EXISTING CONDITIONS
POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 8 of 31

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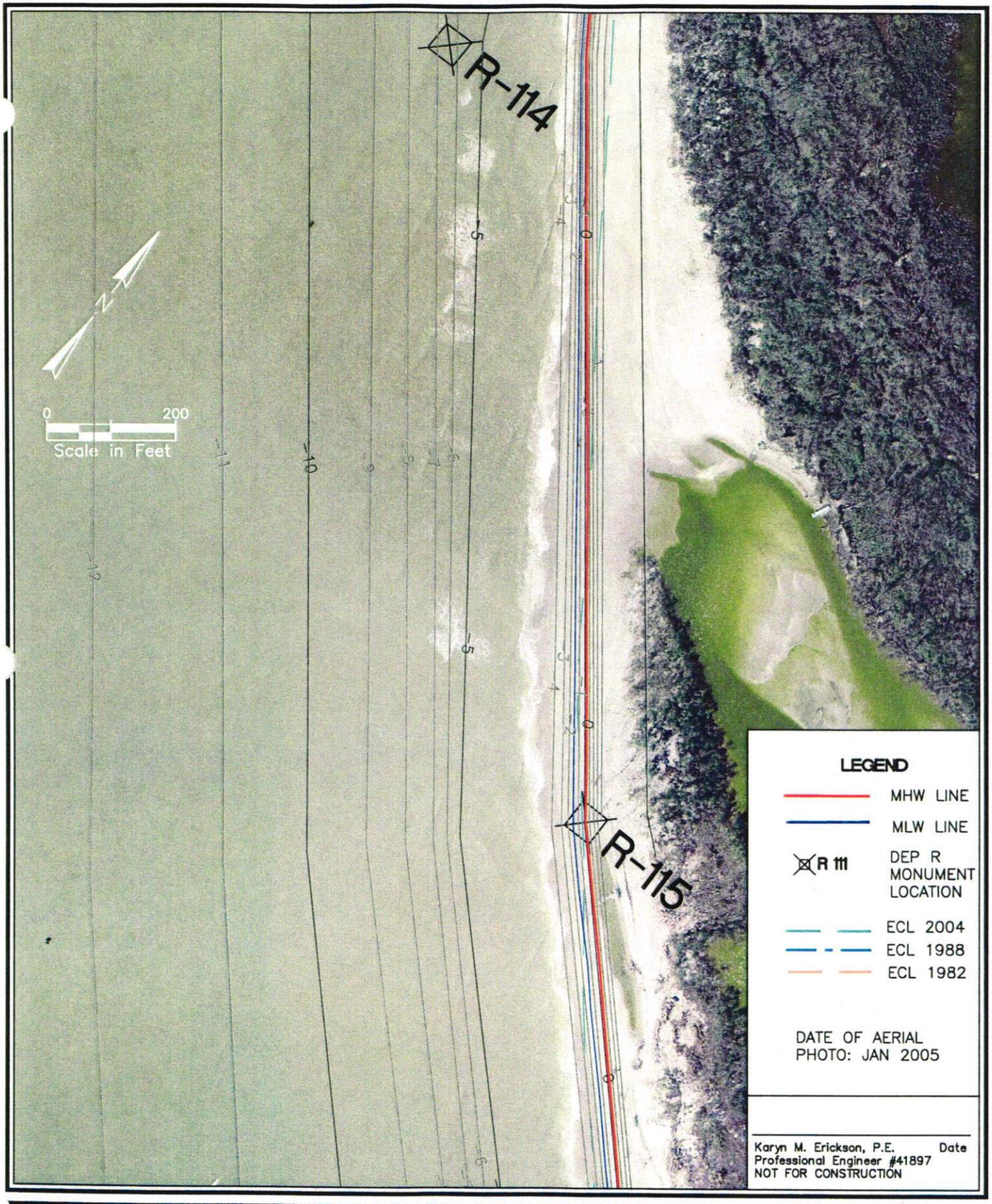

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PLAN VIEW – EXISTING CONDITIONS
POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 9 of 31

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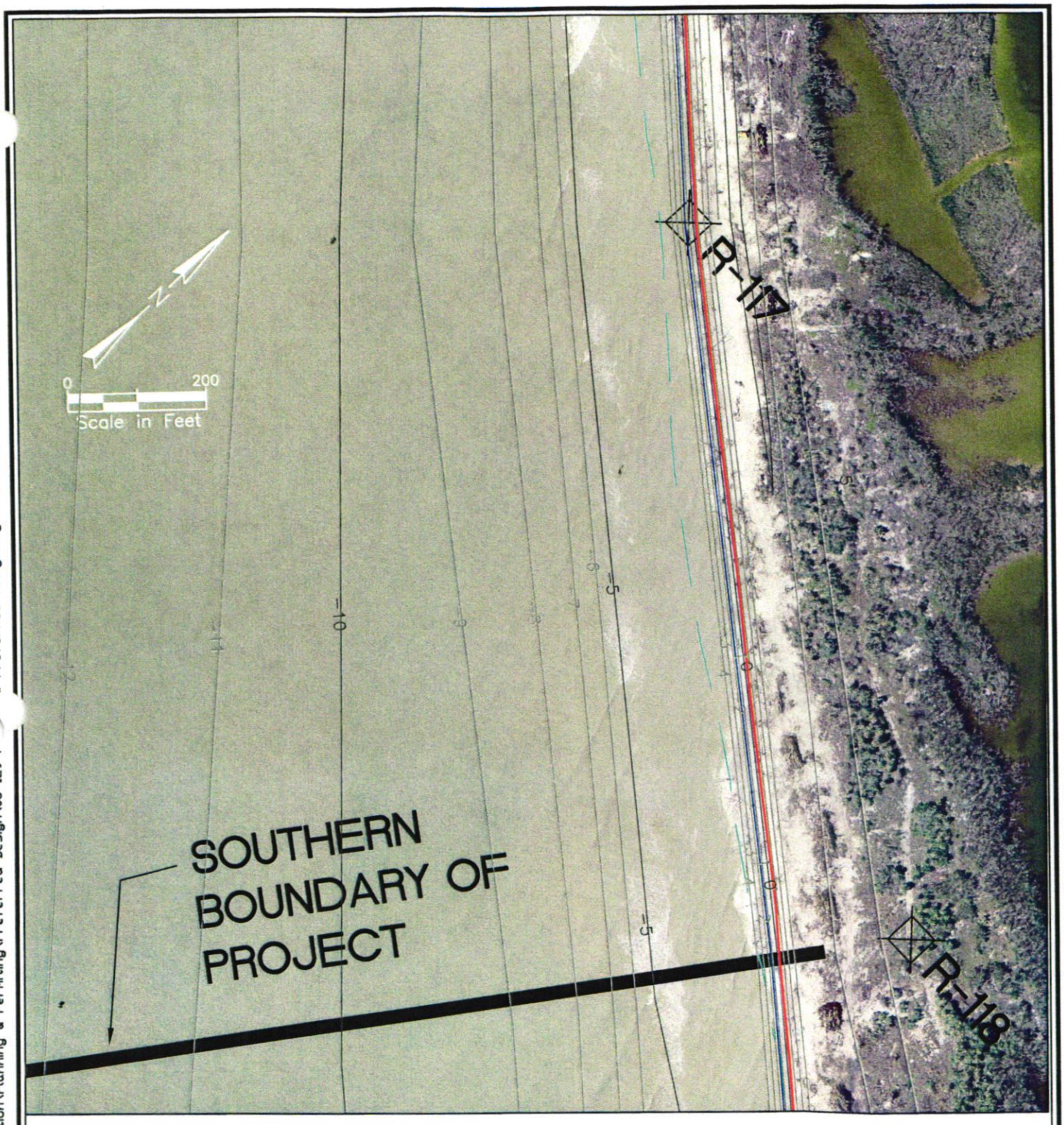
PLAN VIEW – EXISTING CONDITIONS POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 10 of 31



LEGEND

MHW LINE
MLW LINE
R 111 DEP R MONUMENT LOCATION
ECL 2004
ECL 1988
ECL 1982

DATE OF AERIAL PHOTO: JAN 2005

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
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PLAN VIEW – EXISITING CONDITIONS POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 11 of 31

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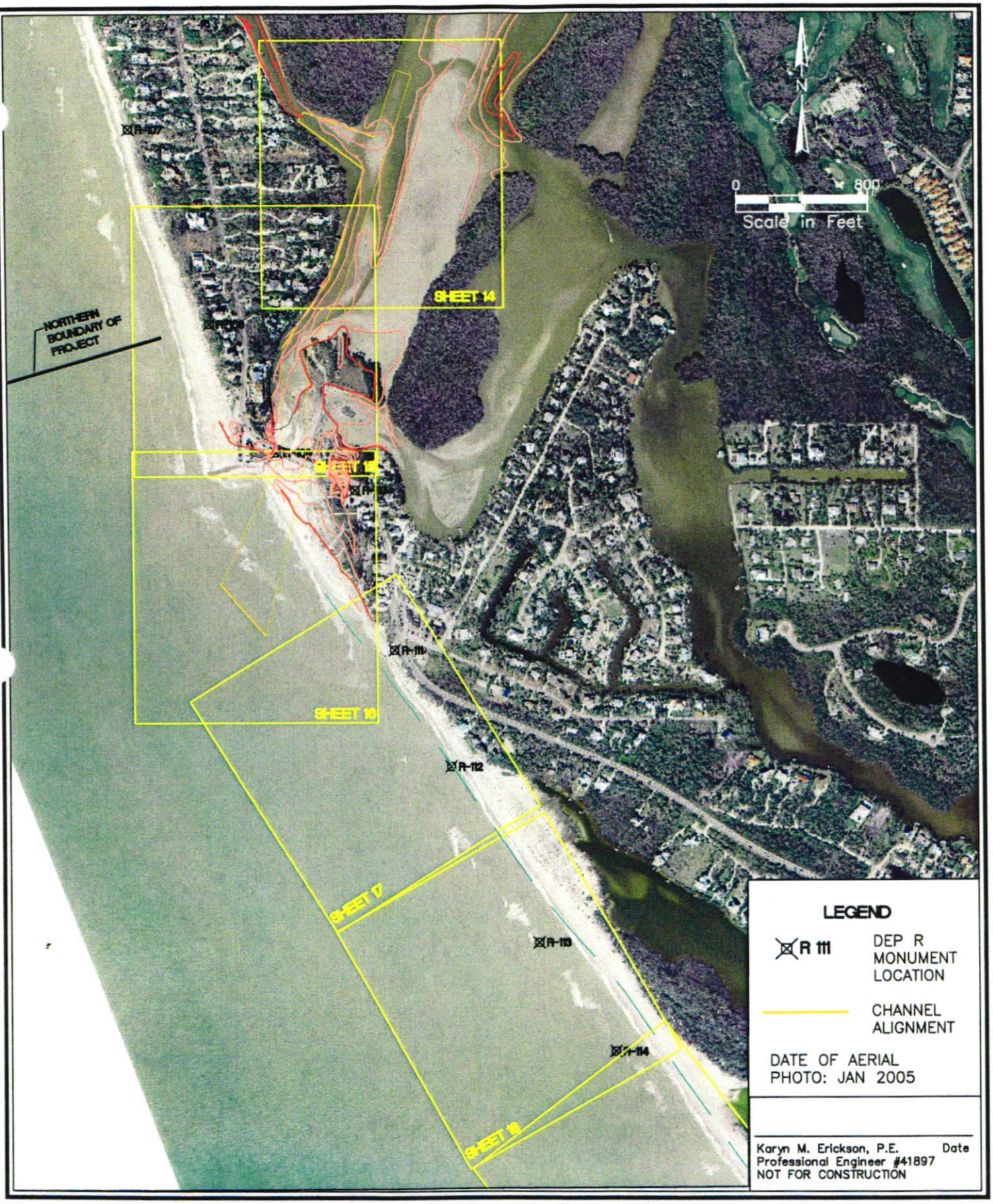

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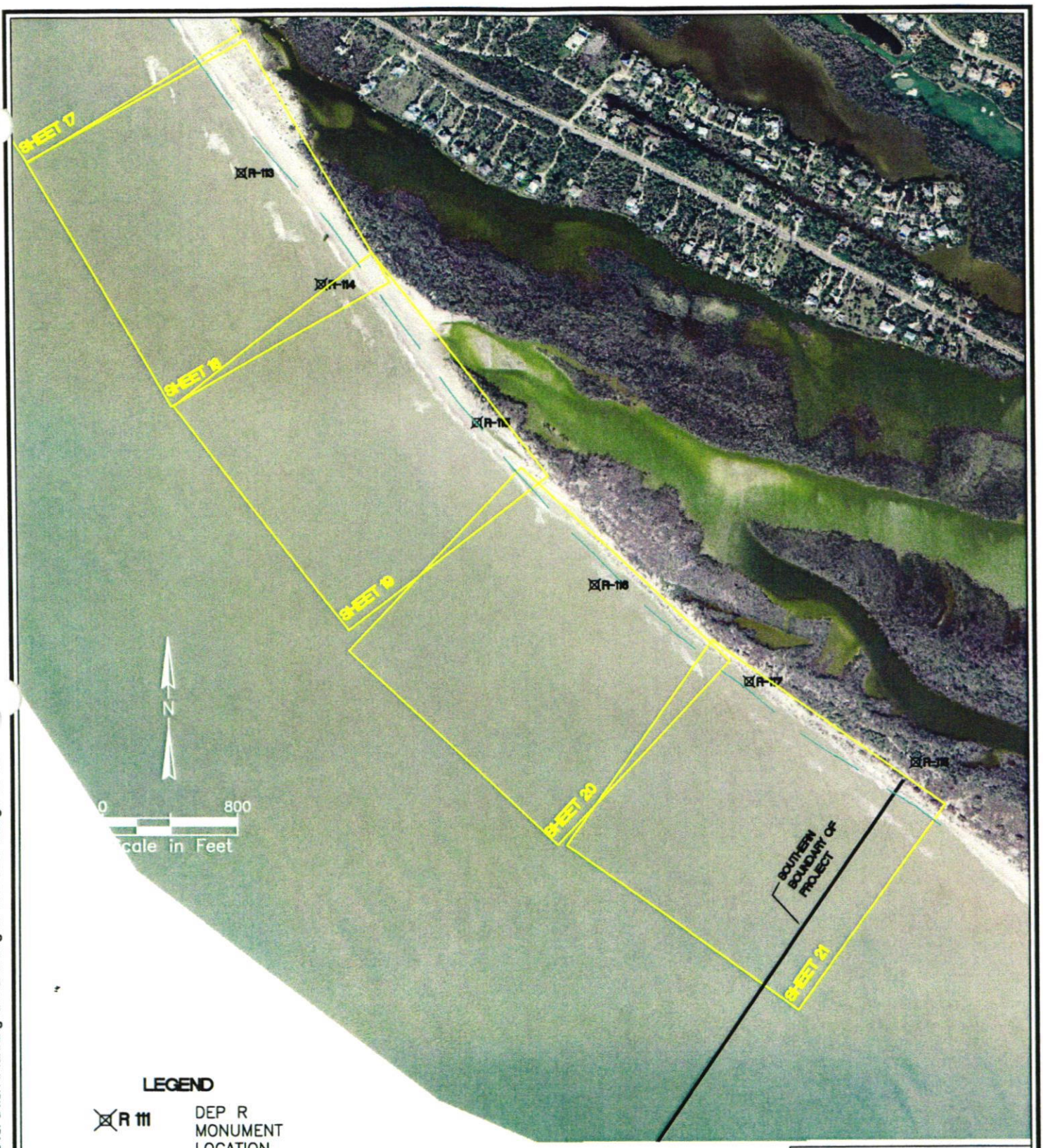
PLAN VIEW – PROPOSED CHANNEL
SHEET INDEX

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=800'	SHEET: 12 of 31



LEGEND

R 111 — DEP R MONUMENT LOCATION

DATE OF AERIAL PHOTO: JAN 2005

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

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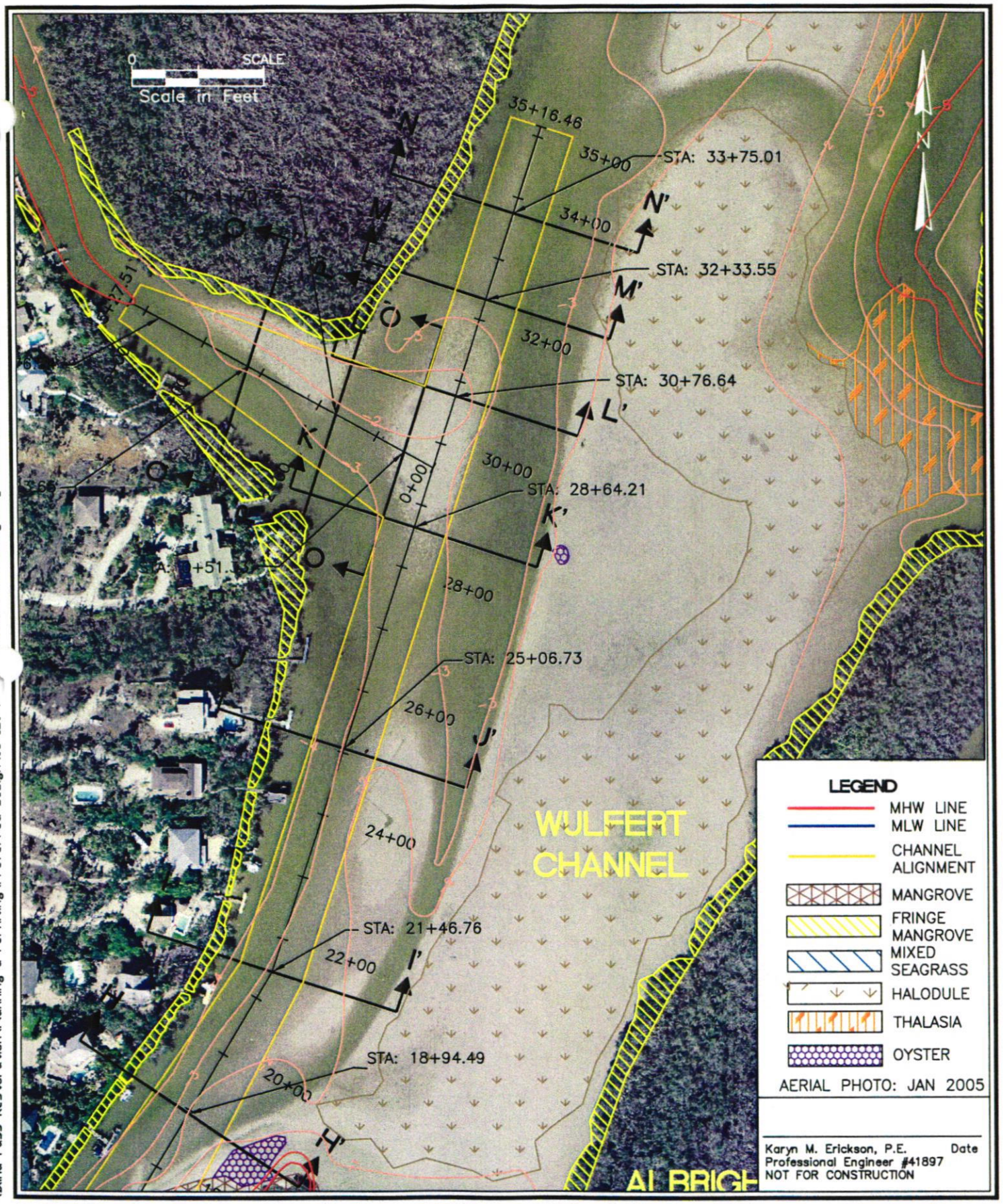
PLAN VIEW – SAND PLACEMENT AREAS
SHEET INDEX

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 01/12/09	DRAWN BY JE
SCALE 1"=800'	SHEET: 13 of 31



Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

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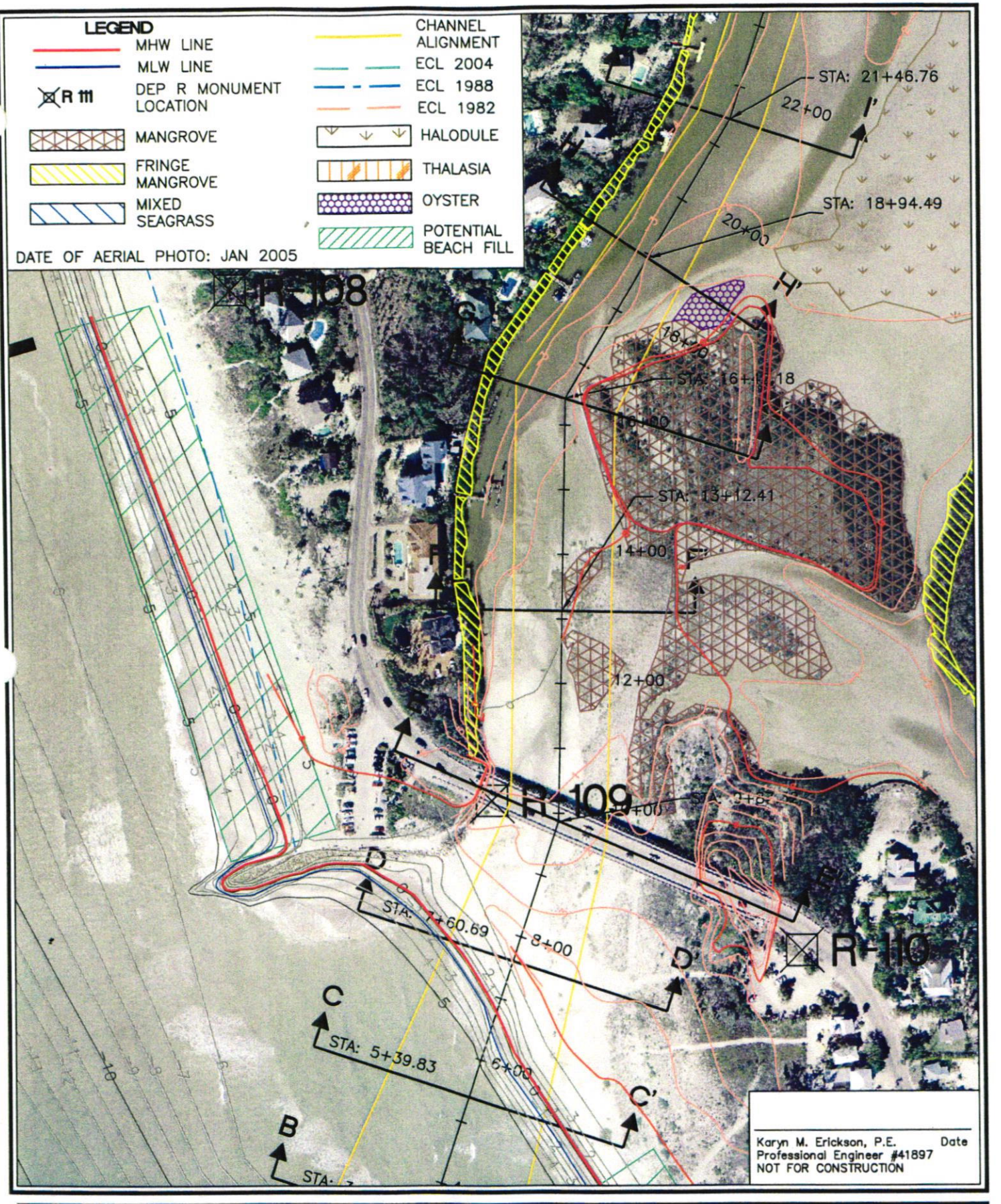
PLAN VIEW
PROPOSED CHANNEL ALIGNMENT

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 01/12/09	DRAWN BY JE
SCALE 1"=200'	SHEET: 14 of 31



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Professional Engineer #41897
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PLAN VIEW
PROPOSED CHANNEL ALIGNMENT

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 01/12/09	DRAWN BY JE
SCALE 1"=200'	SHEET: 15 of 31

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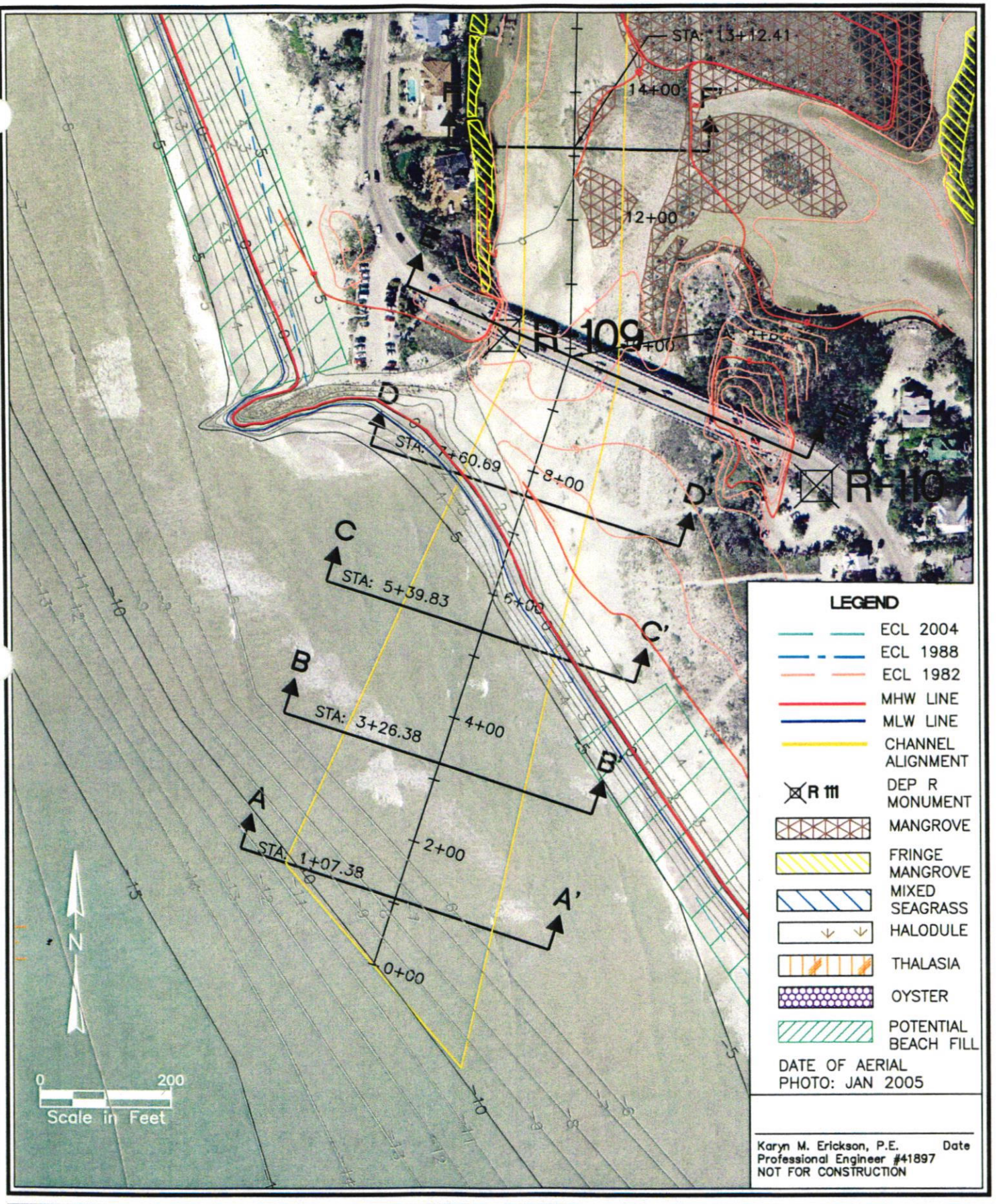

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PLAN VIEW
PROPOSED CHANNEL ALIGNMENT

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 16 of 31

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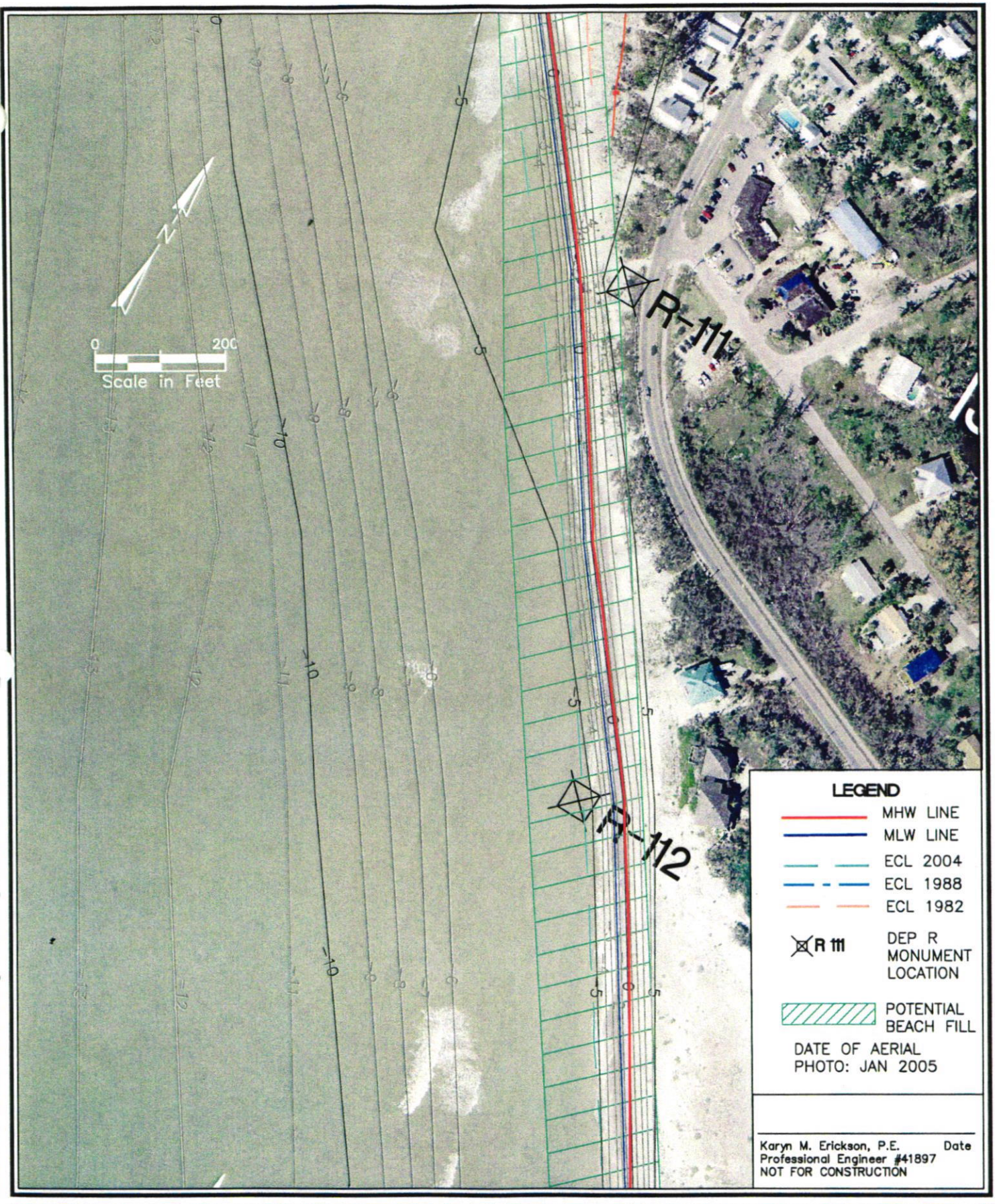

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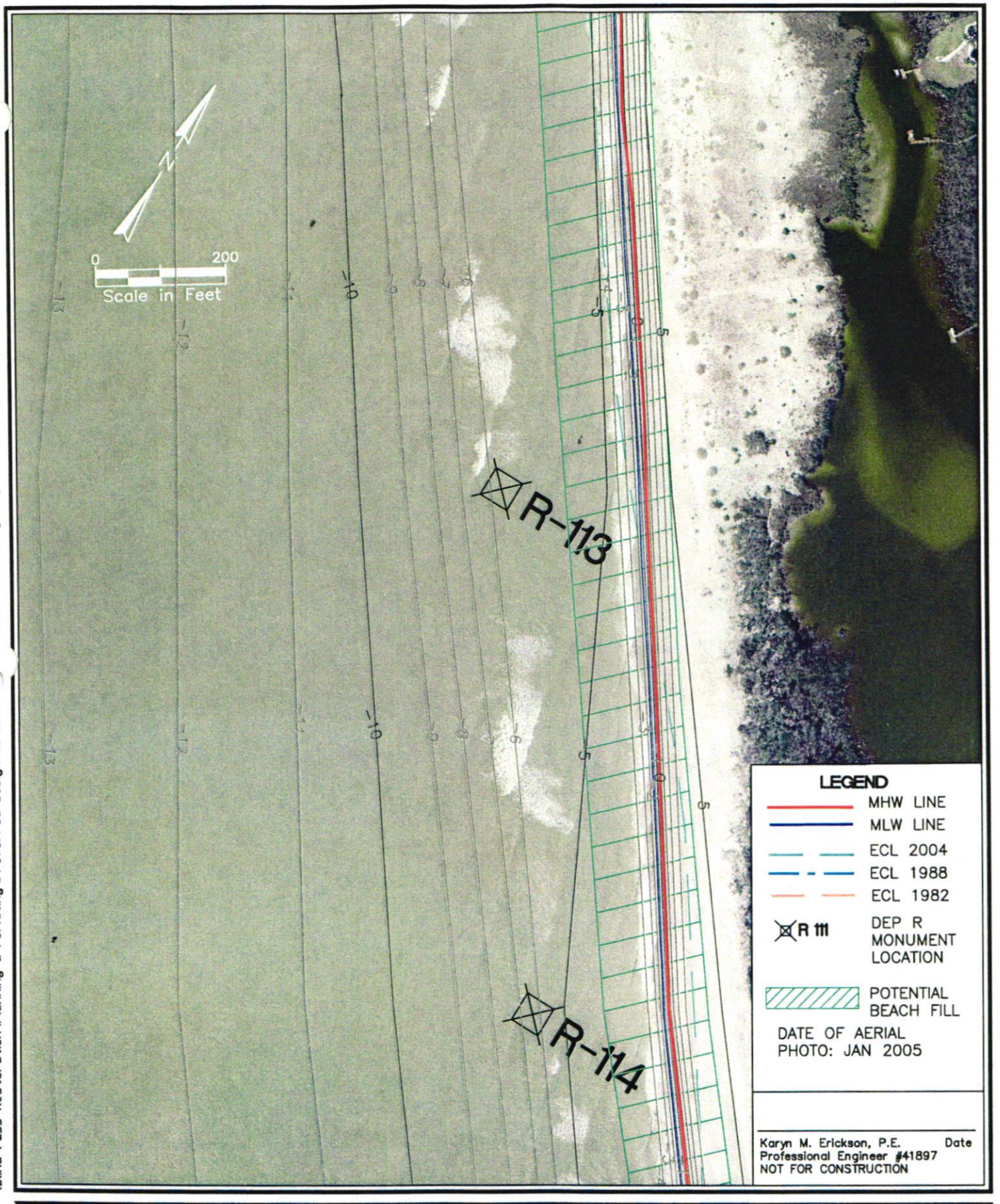
PLAN VIEW – PROPOSED POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 17 of 31



Karyn M. Erickson, P.E. Date
Professional Engineer #41897
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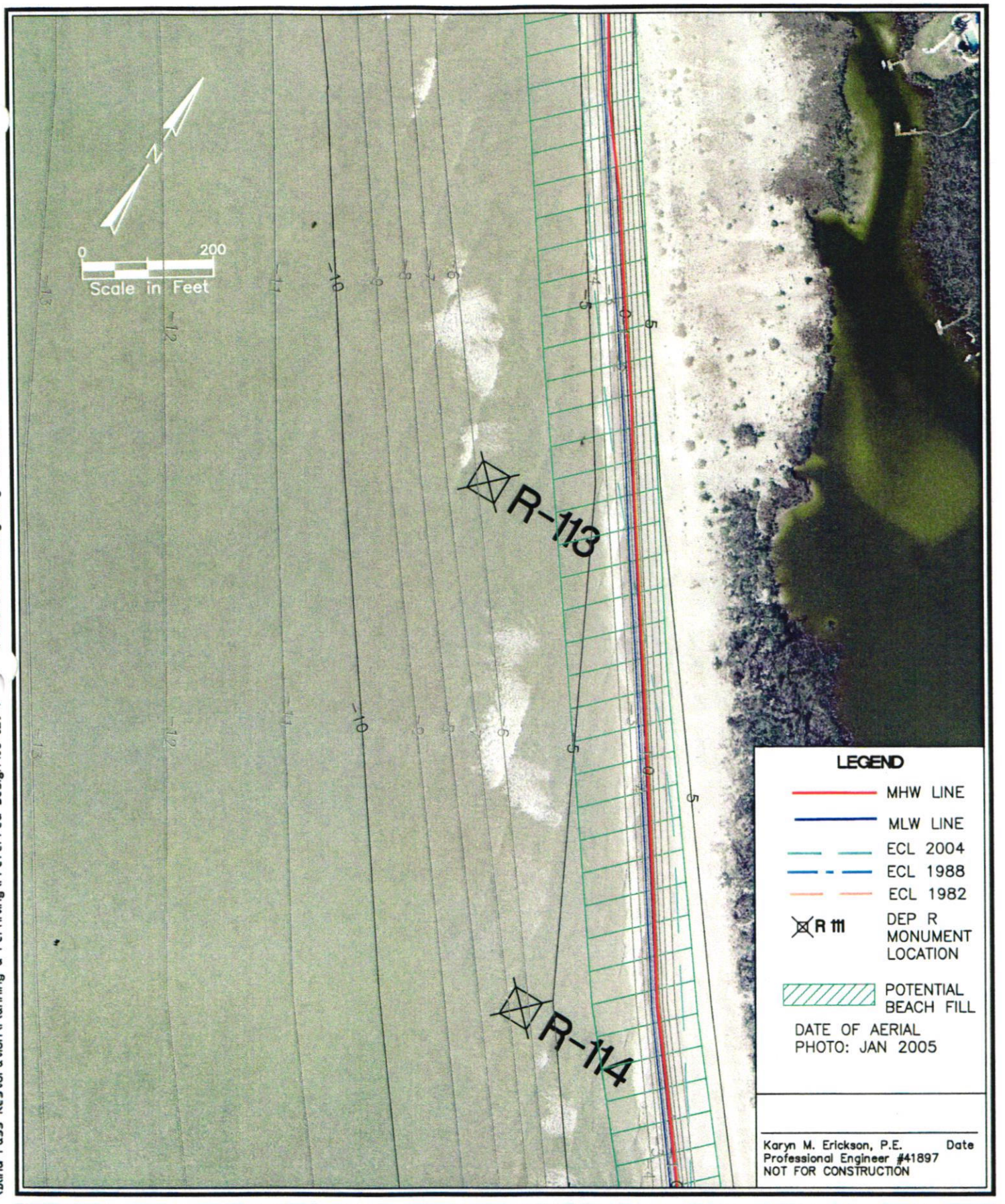
PLAN VIEW – PROPOSED POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 18 of 31



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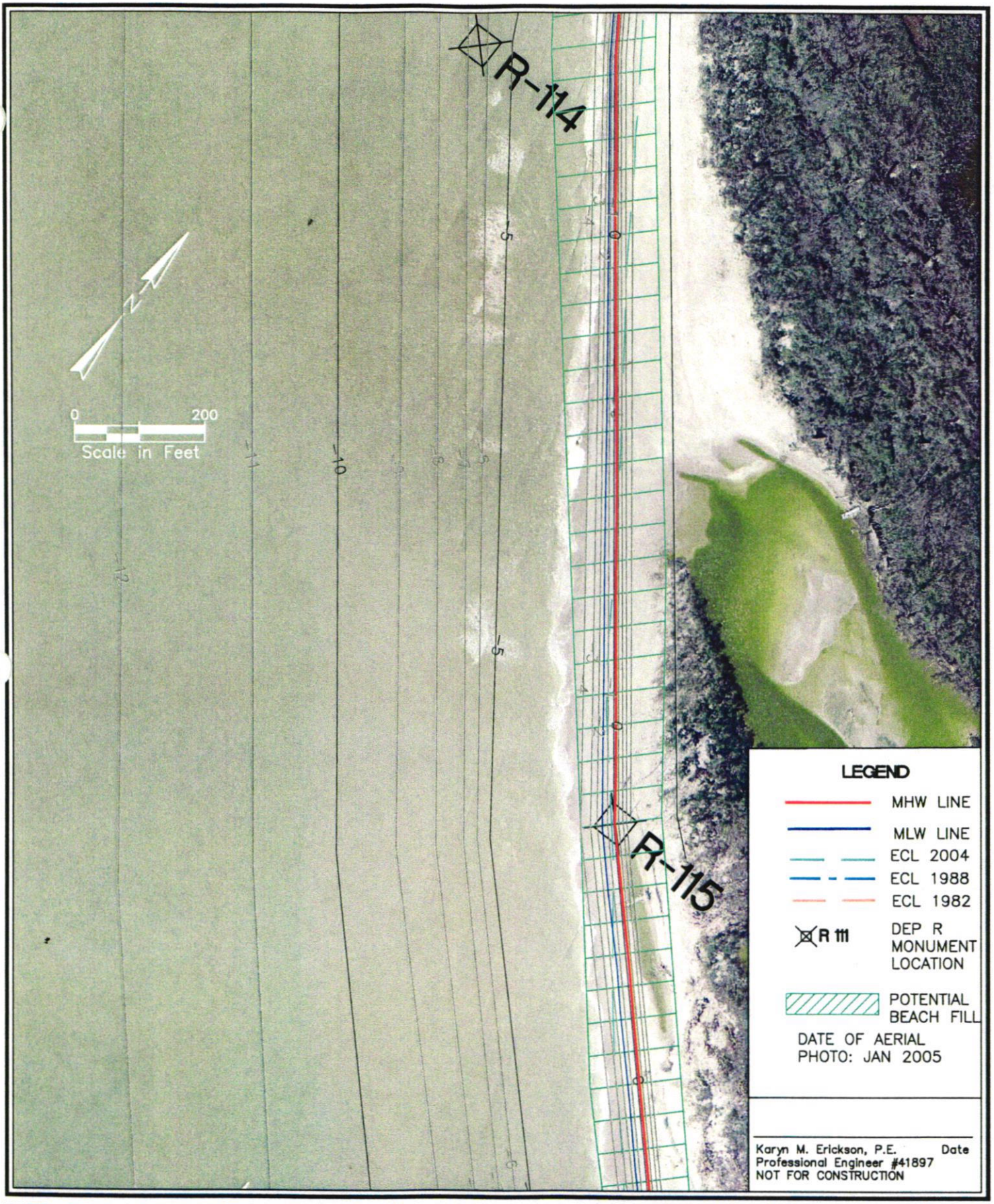
PLAN VIEW – PROPOSED POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 19 of 31



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PLAN VIEW – PROPOSED POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 21 of 32

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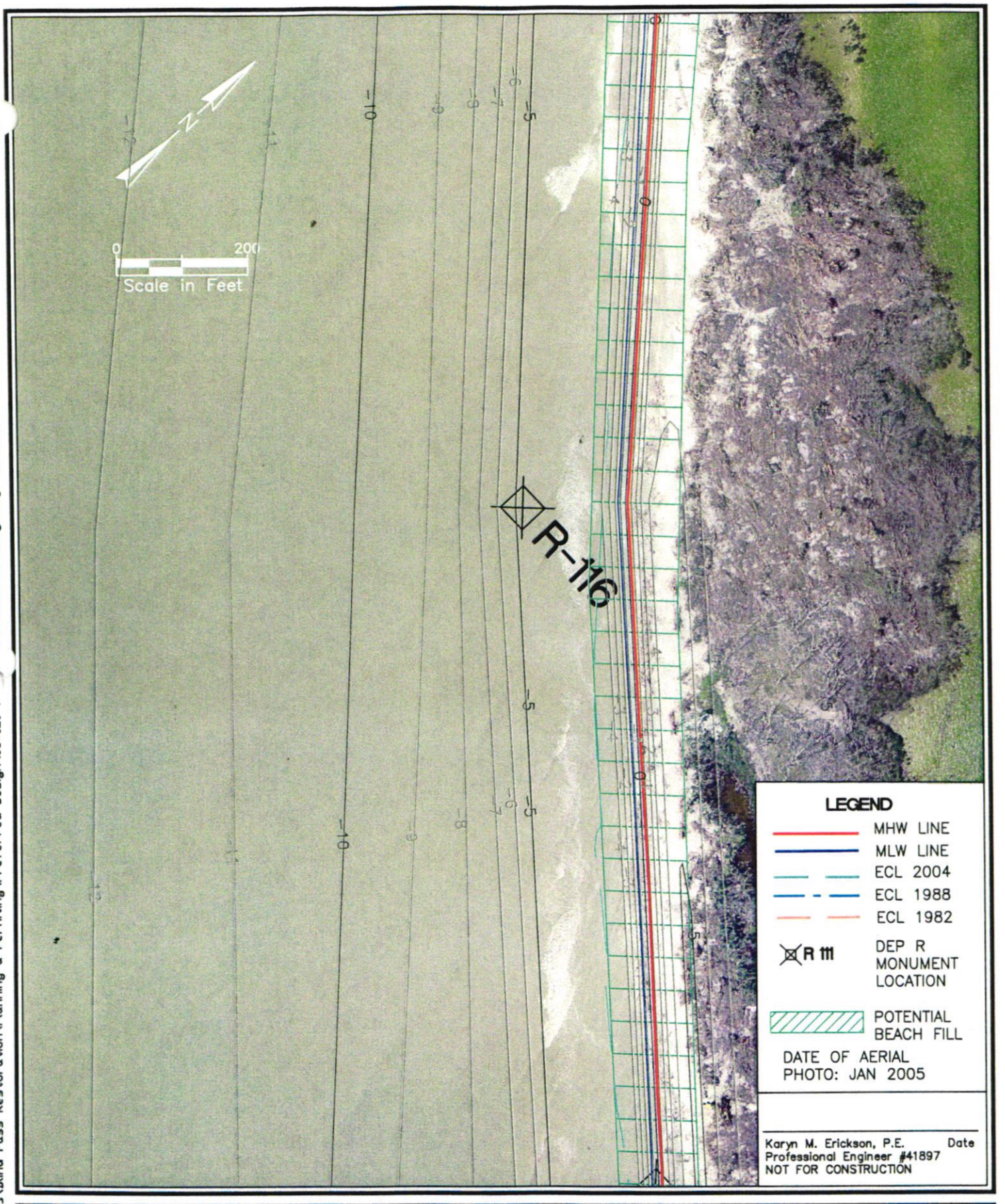

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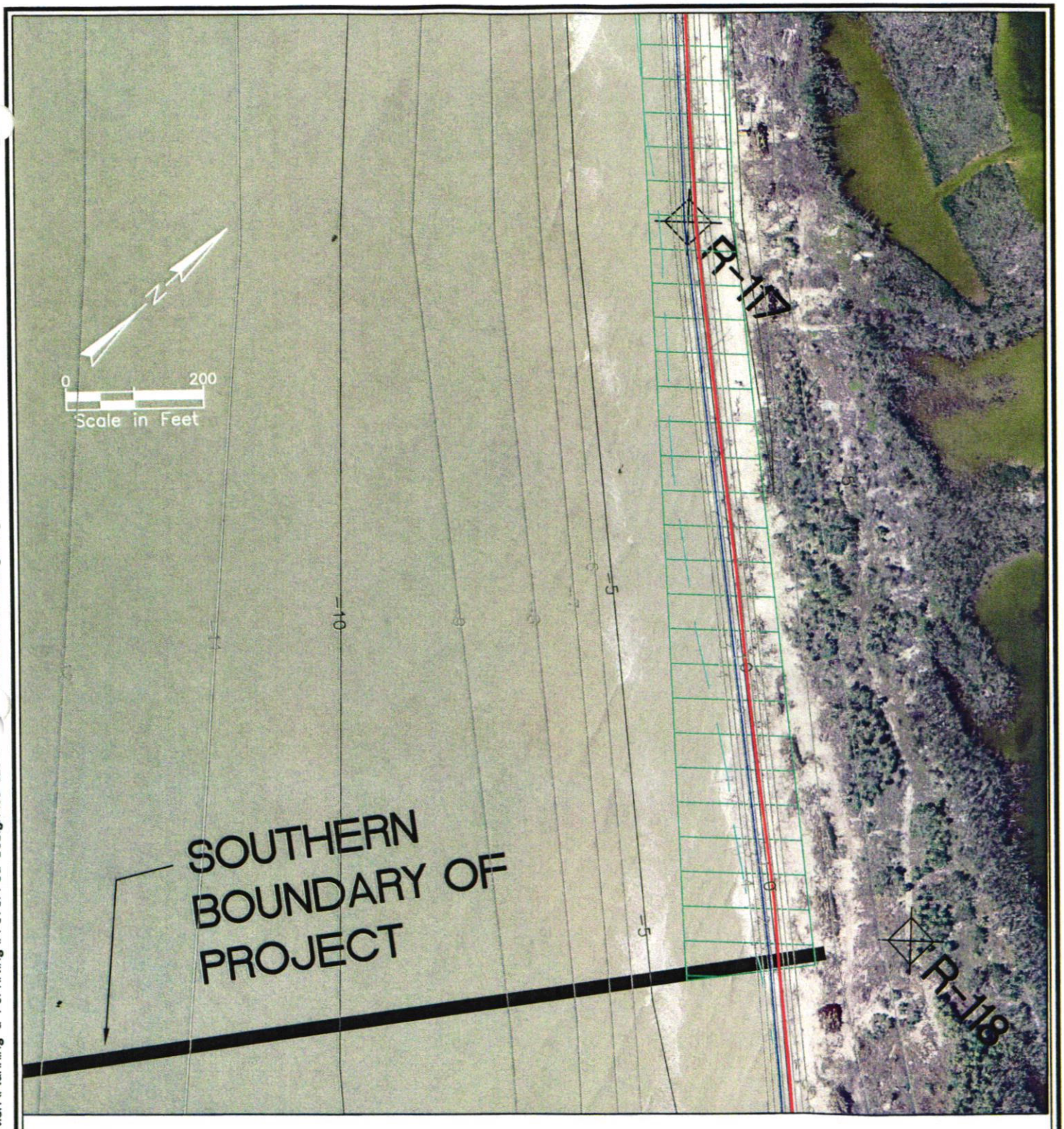
PLAN VIEW – PROPOSED
POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 21 of 31



LEGEND

- MHW LINE
- MLW LINE
- ECL 2004
- ECL 1988
- ECL 1982

R 111 DEP R MONUMENT LOCATION

POTENTIAL BEACH FILL

DATE OF AERIAL PHOTO: JAN 2005

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
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PLAN VIEW – PROPOSED POTENTIAL SAND PLACEMENT AREA

Blind Pass Restoration
Lee County, FLorida

REVISIONS

PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE 1"=200'	SHEET: 22 of 31

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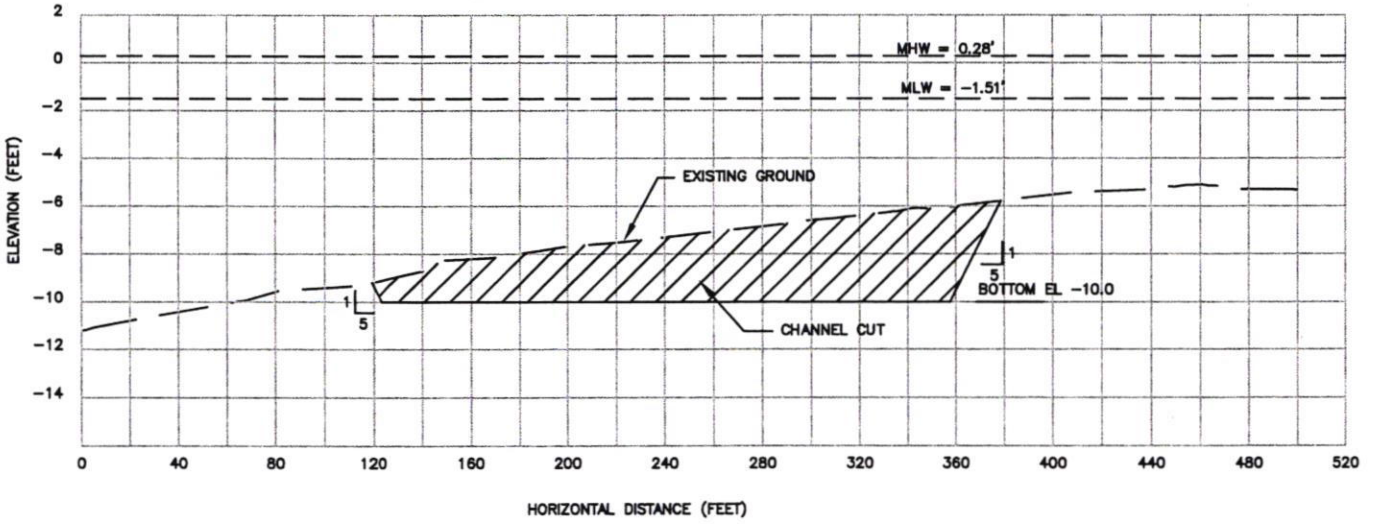
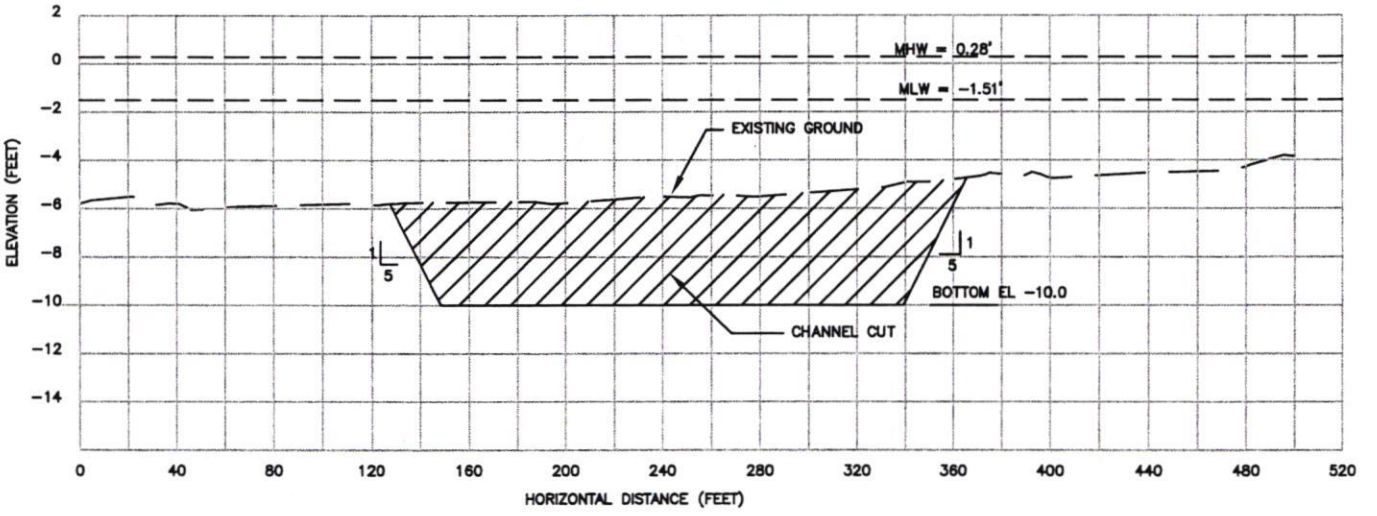


SECTION A–A'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET



SECTION B–B'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET

NOTES:
1. CHANNEL CROSS SECTIONS BASED ON SURVEY BY MCKIM AND CREED, MAY 2005. ELEVATIONS IN FEET, NAVD 88.

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
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CHANNEL CROSS SECTIONS
SECTIONS A–A' AND B–B'

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05–129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE As Shown	SHEET: 23 of 31

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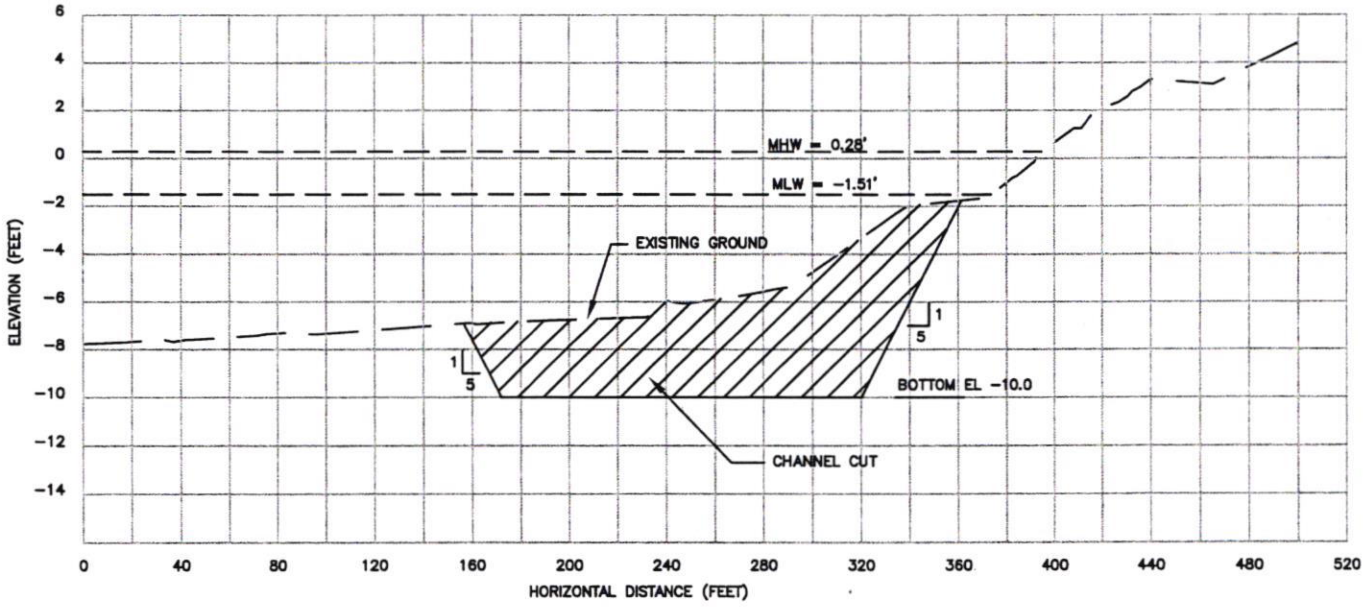
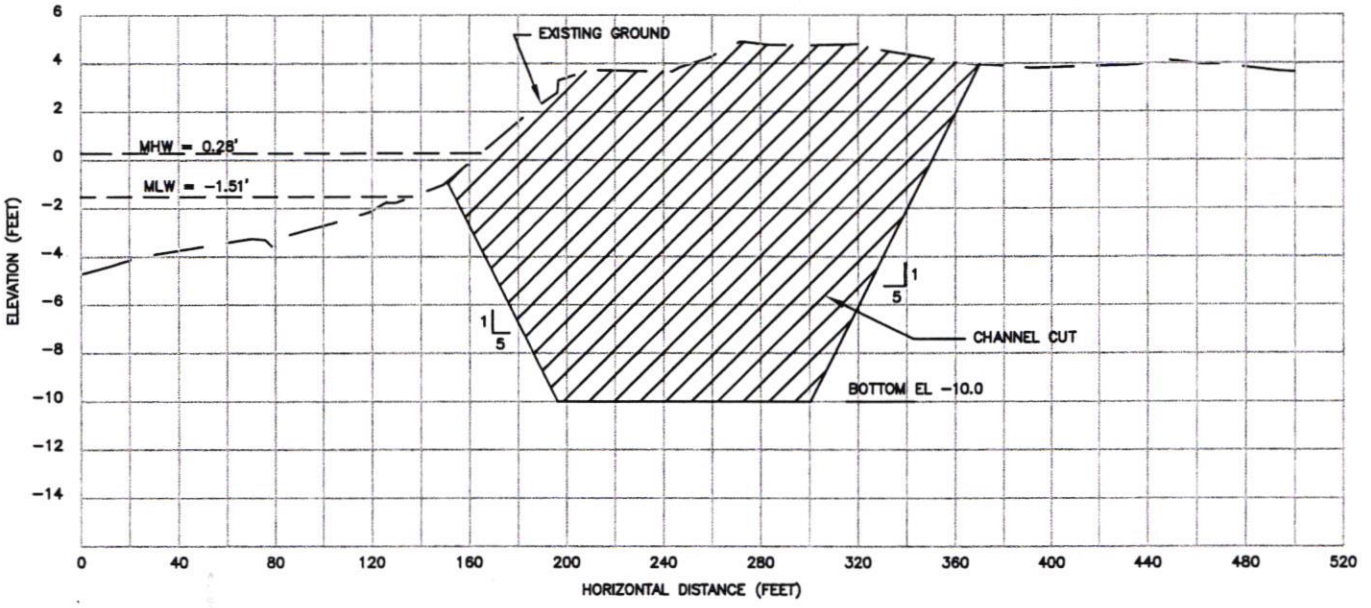


CROSS SECTION C–C'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET



SECTION D–D'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET

NOTES:
1. CHANNEL CROSS SECTIONS BASED ON SURVEY BY MCKIM AND CREED, MAY 2005. ELEVATIONS IN FEET, NAVD 88.

Karyn M. Erickson, P.E. Date
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CHANNEL CROSS SECTIONS
SECTIONS C–C' AND D–D'

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05–129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE As Shown	SHEET: 24 of 31

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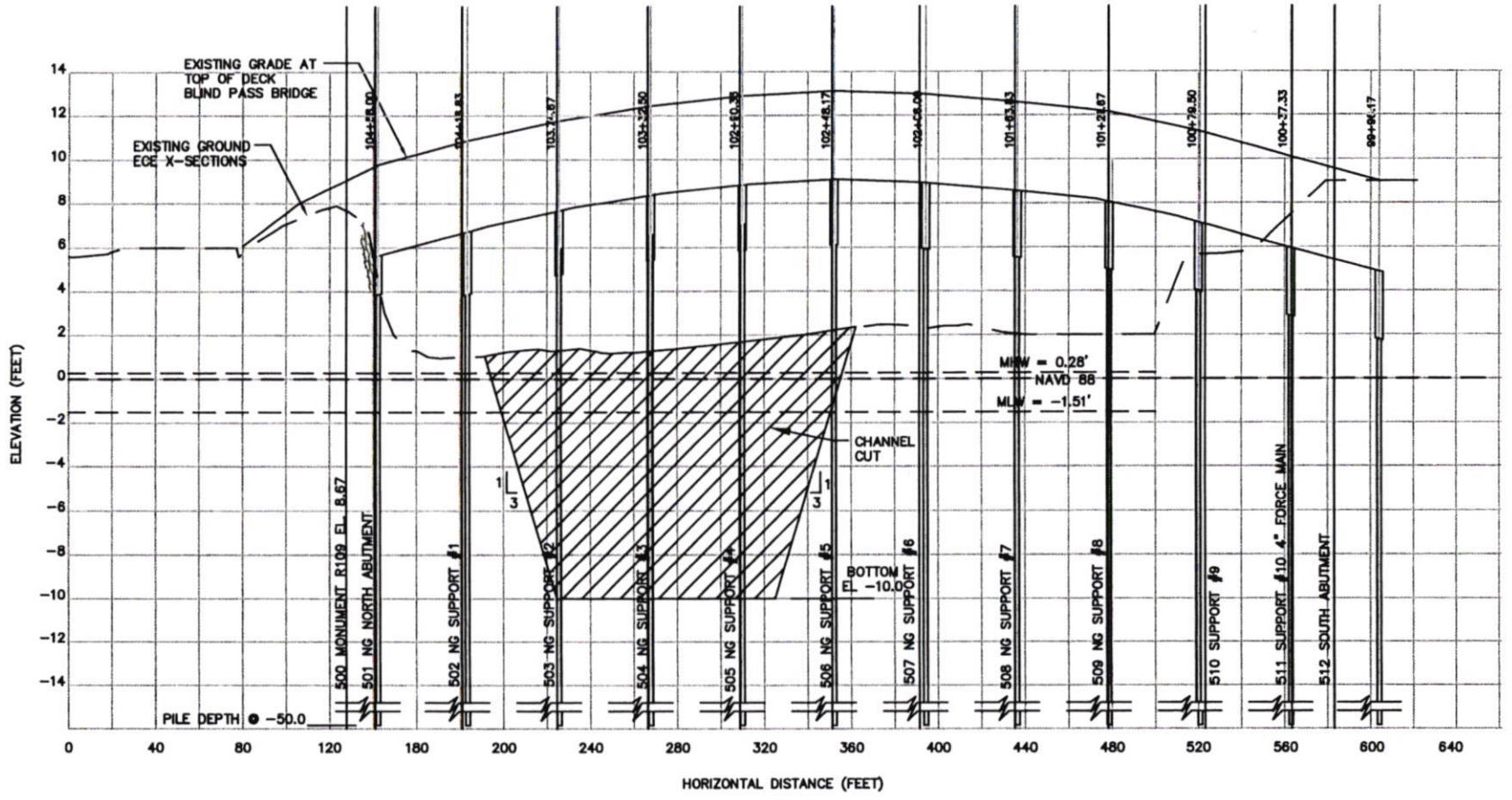
CHANNEL CROSS SECTIONS
SECTIONS E-E'

Blind Pass Restoration
Lee County, Florida



CHANNEL SECTION E-E' AT EXISTING BRIDGE

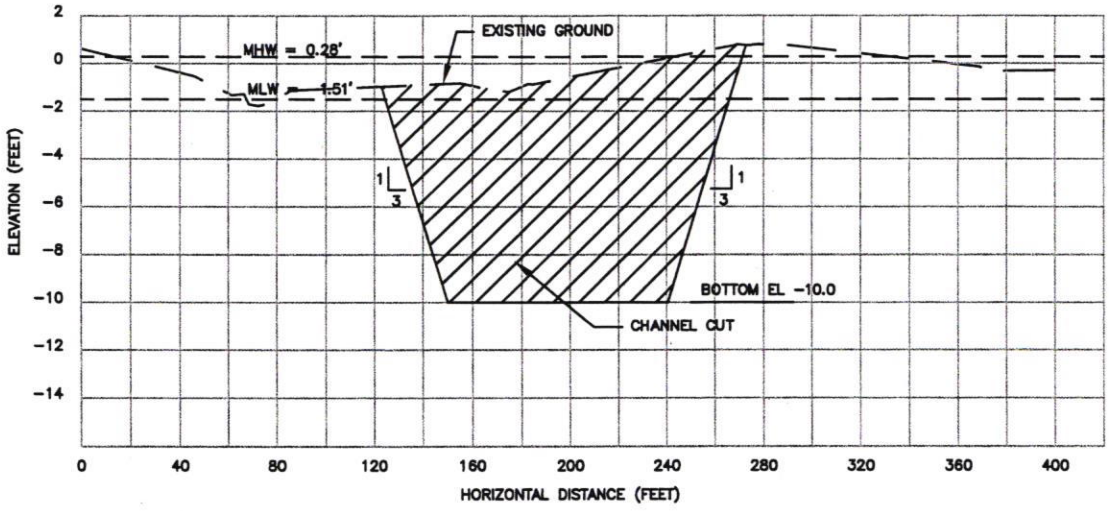
SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET

NOTES:
1. CHANNEL CROSS SECTIONS BASED ON SURVEY BY MCKIM AND CREED, MAY 2005. ELEVATIONS IN FEET, NAVD 88.
2. BRIDGE PROFILE TAKEN FROM RECORD DRAWINGS B-2, B-6 & B-7, BLIND PASS BRIDGE REPLACEMENT, DATED FEB. 26, 1991 BY JENKINS & CHARLAND, INC.

REVISIONS

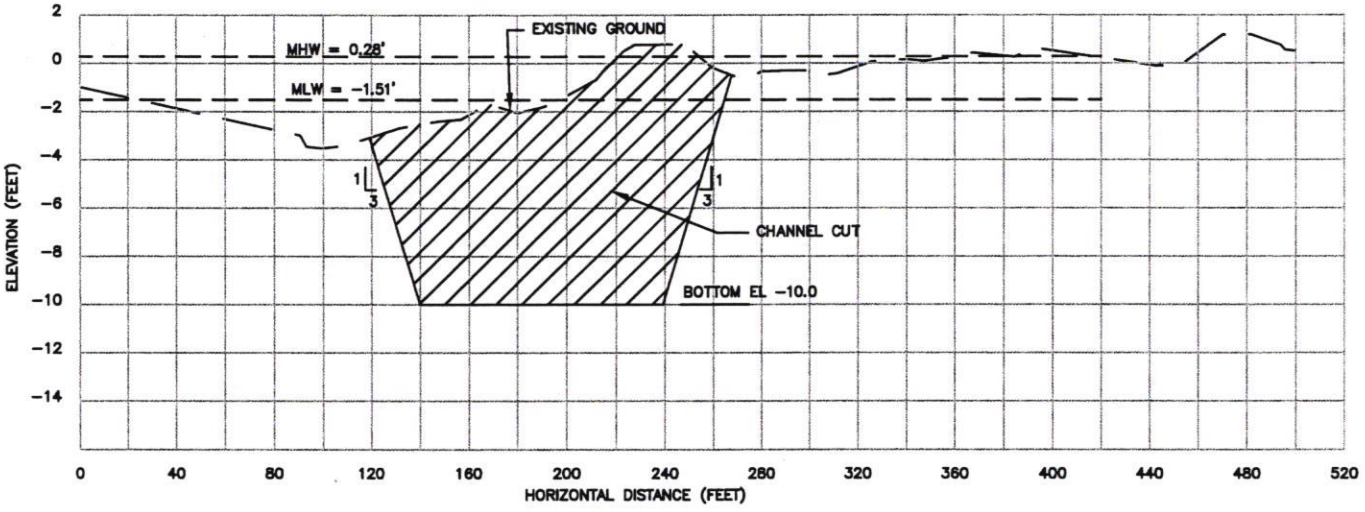
PROJECT 05-129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE As Shown	SHEET: 25 of 31

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION



SECTION F–F'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET



SECTION G–G'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET

NOTES:
1. CHANNEL CROSS SECTIONS BASED ON SURVEY BY MCKIM AND CREED, MAY 2005. ELEVATIONS IN FEET, NAVD 88.

Karyn M. Erickson, P.E. Date
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(941) 952-0487

CHANNEL CROSS SECTIONS
SECTIONS F–F' AND G–G'

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05–129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE As Shown	SHEET: 26 of 31

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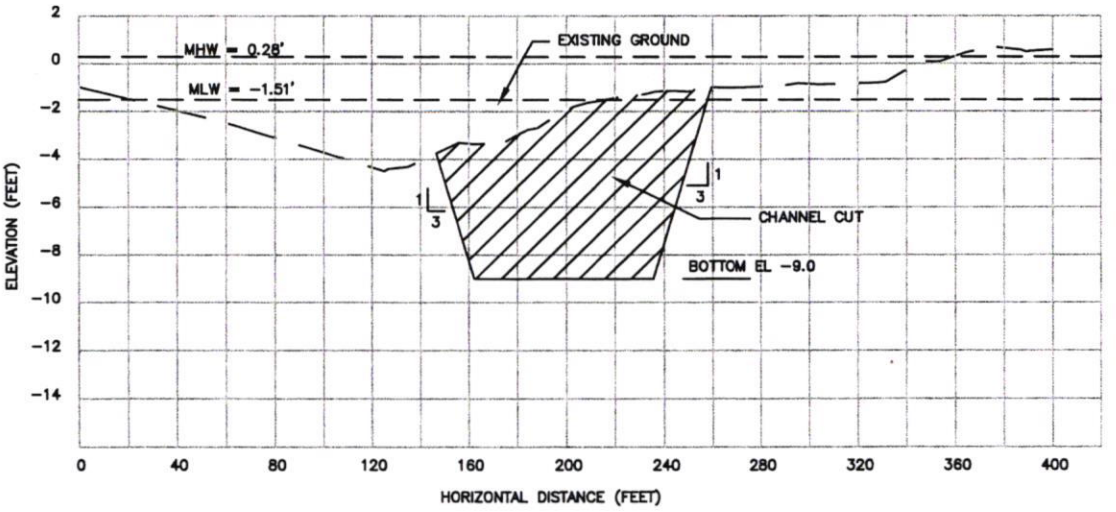

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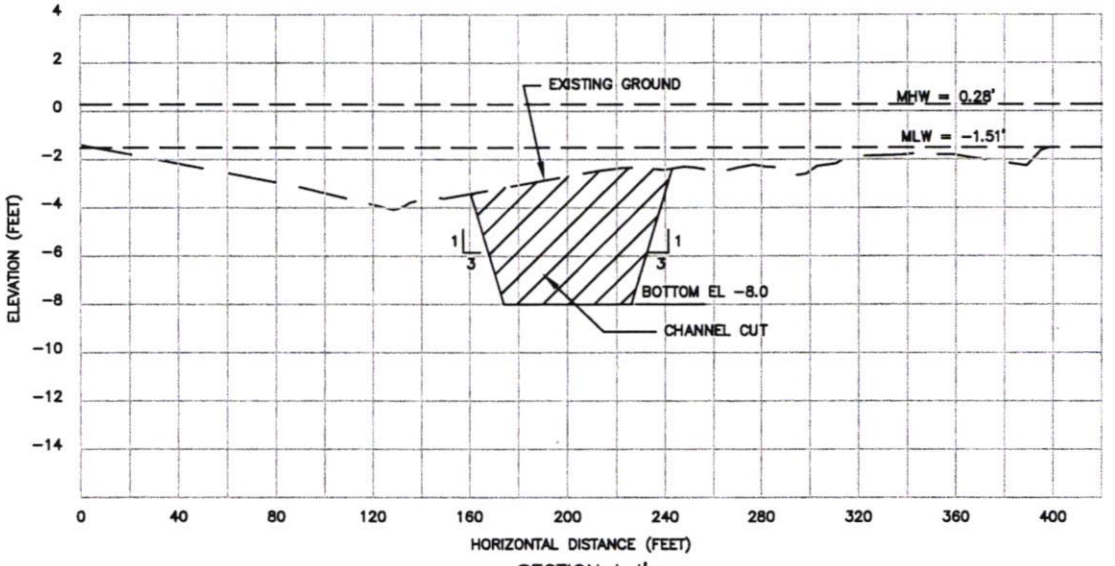

SECTION I–I'

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VERT. 1"= 8 FEET

NOTES:
1. CHANNEL CROSS SECTIONS BASED ON SURVEY BY MCKIM AND CREED, MAY 2005. ELEVATIONS IN FEET, NAVD 88.

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CHANNEL CROSS SECTIONS
SECTIONS H–H' AND I–I'

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REVISIONS

PROJECT 05–129	CHECKED BY JG
DATE 04/28/06	DRAWN BY JE
SCALE As Shown	SHEET: 27 of 31

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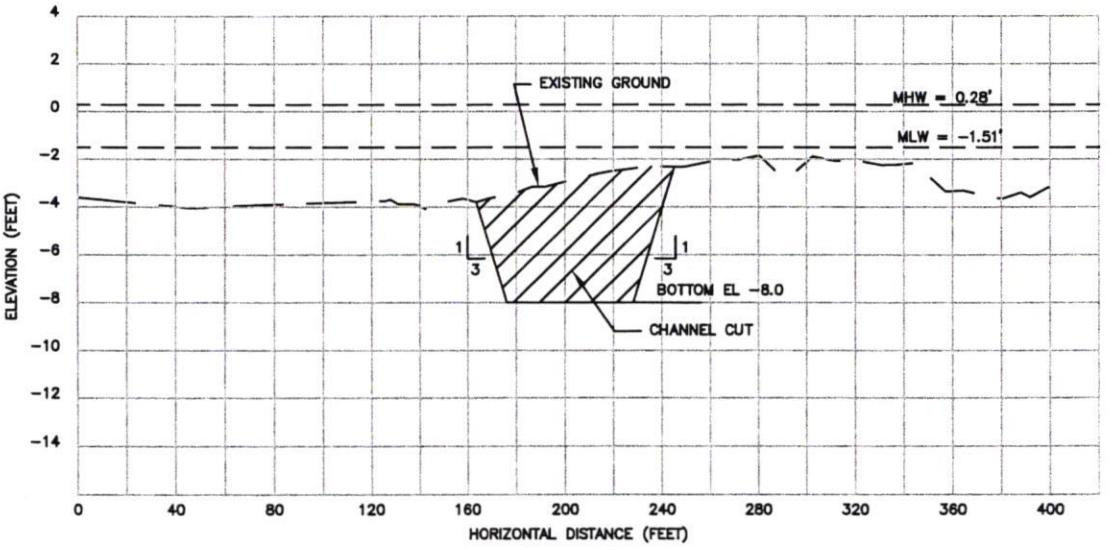

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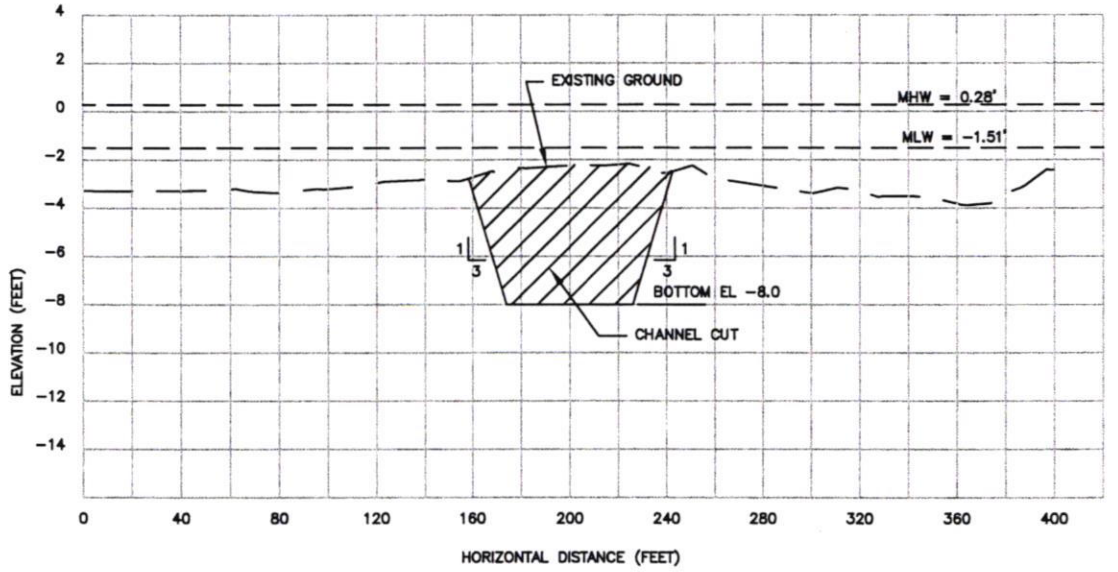

SECTION K–K'

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VERT. 1"= 8 FEET

NOTES:
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CHANNEL CROSS SECTIONS
SECTIONS J–J' AND K–K'

Blind Pass Restoration
Lee County, Florida

REVISIONS

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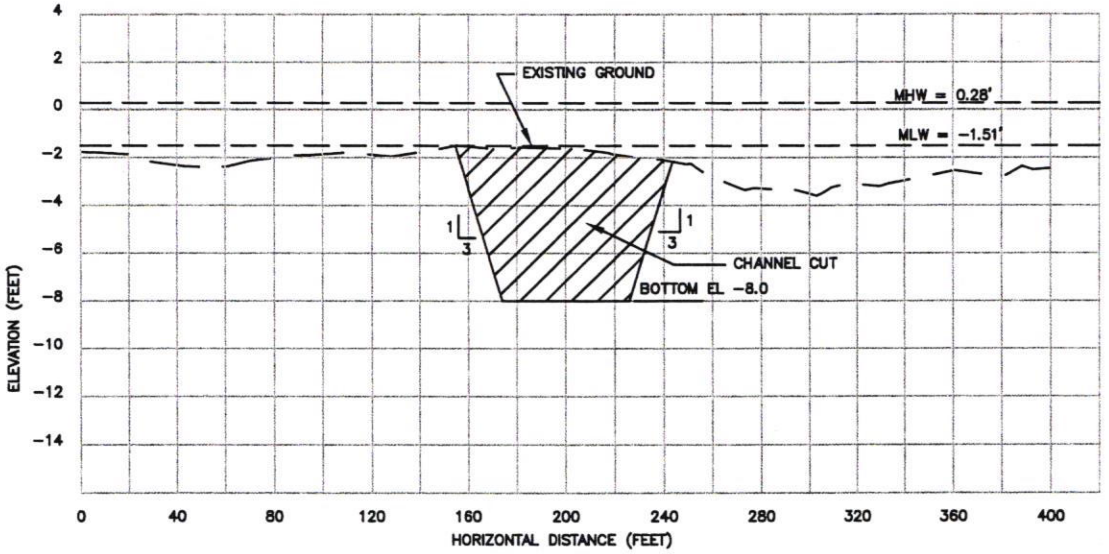

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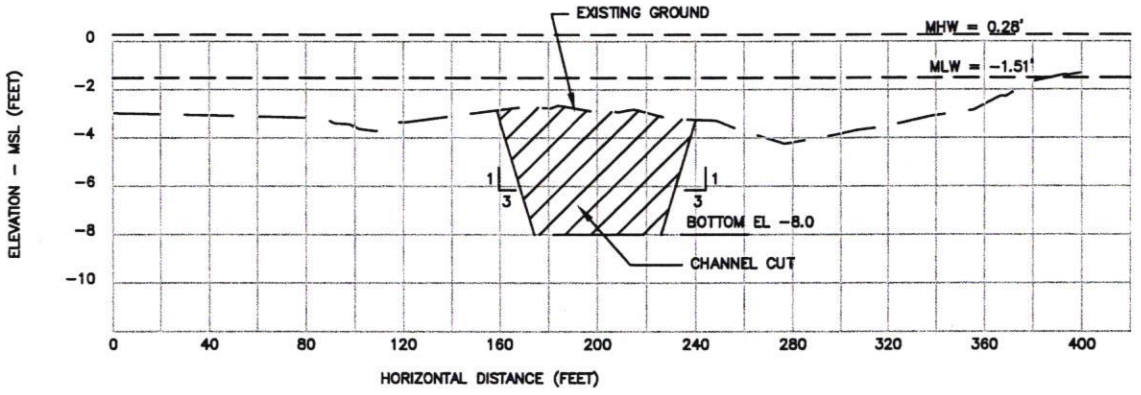

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VERT. 1"= 8 FEET

NOTES:
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CHANNEL CROSS SECTIONS
SECTIONS L–L' AND M–M'

Blind Pass Restoration
Lee County, Florida

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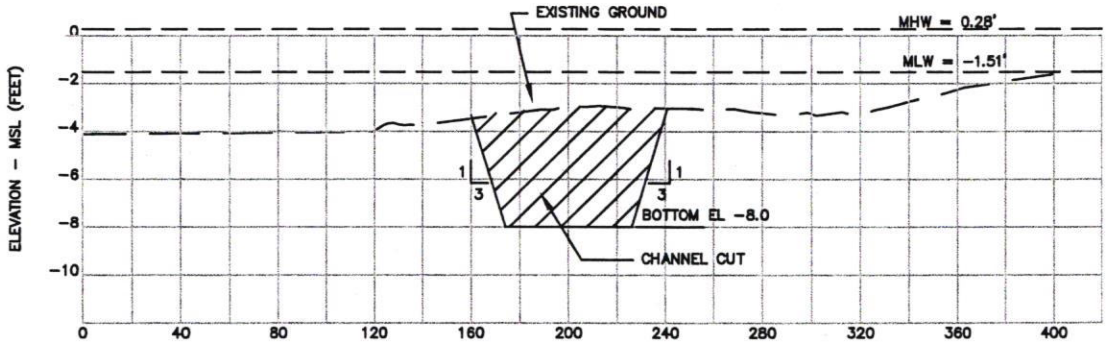

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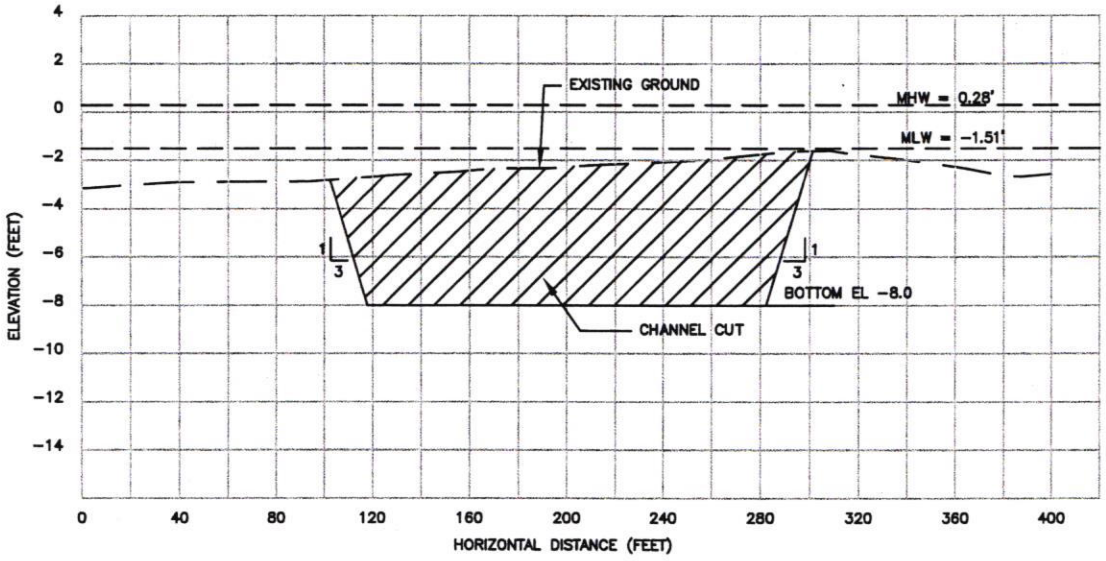
VERT. 1"= 8 FEET



SECTION O–O'

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VERT. 1"= 8 FEET

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CHANNEL CROSS SECTIONS
SECTIONS N–N' AND O–O'

Blind Pass Restoration
Lee County, Florida

REVISIONS

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DATE 04/28/06	DRAWN BY JE
SCALE As Shown	SHEET: 30 of 31

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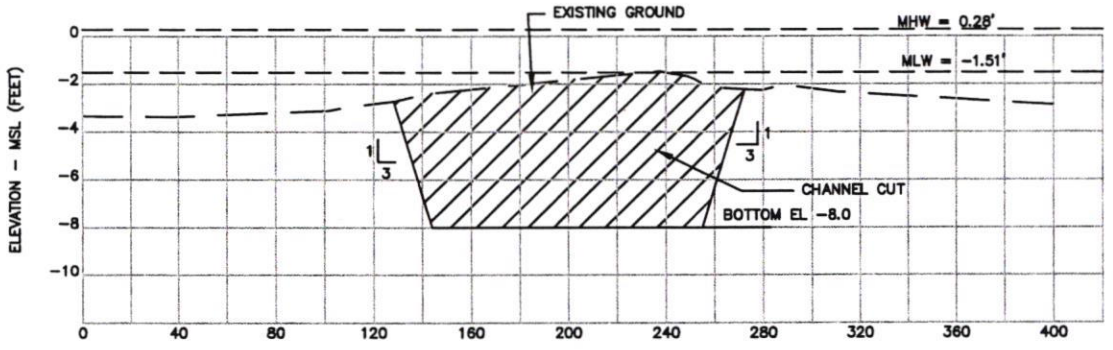

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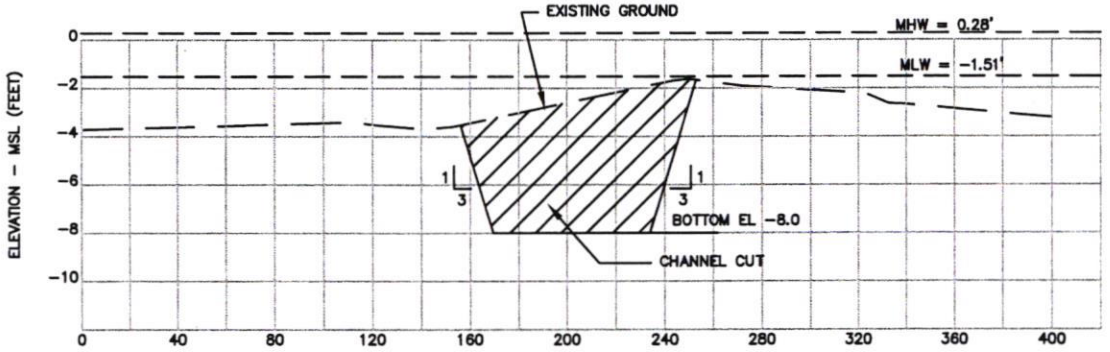
VERT. 1"= 8 FEET



SECTION Q-Q'

SCALE: HORIZ. 1"=80 FEET
VERT. 1"= 8 FEET

NOTES:
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CHANNEL CROSS SECTIONS
SECTIONS P-P' AND Q-Q'

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05-129	CHECKED BY JG
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Environmental Baseline Report
Blind Pass FL

Prepared for
Erickson Consulting Engineers
1819 Main Street, Suite 404
Sarasota, FL 34236

by
Dial Cordy and Associates Inc.
490 Osceola Ave
Jacksonville Beach, Florida 32250
904.241.8821

April 26, 2006

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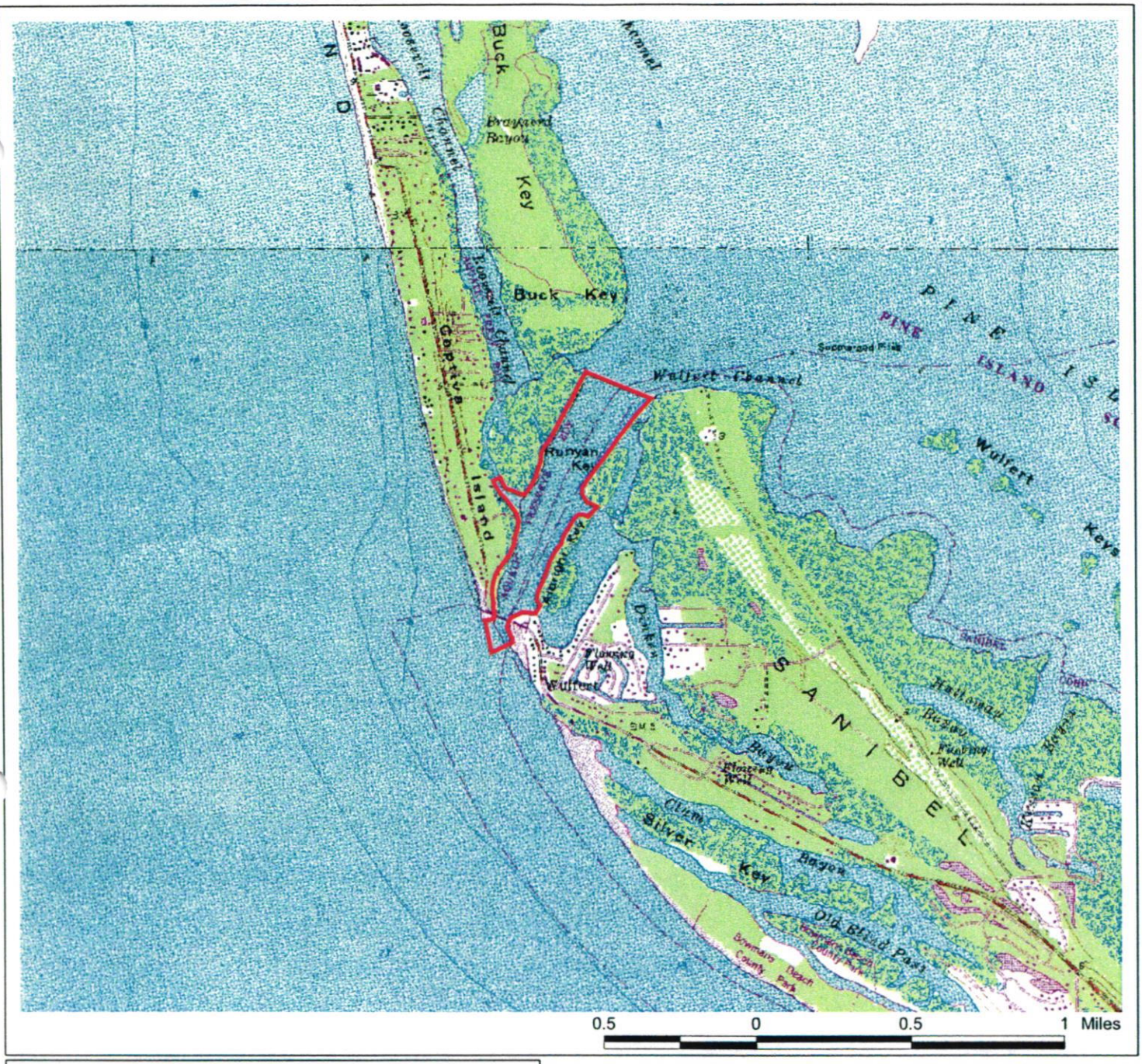
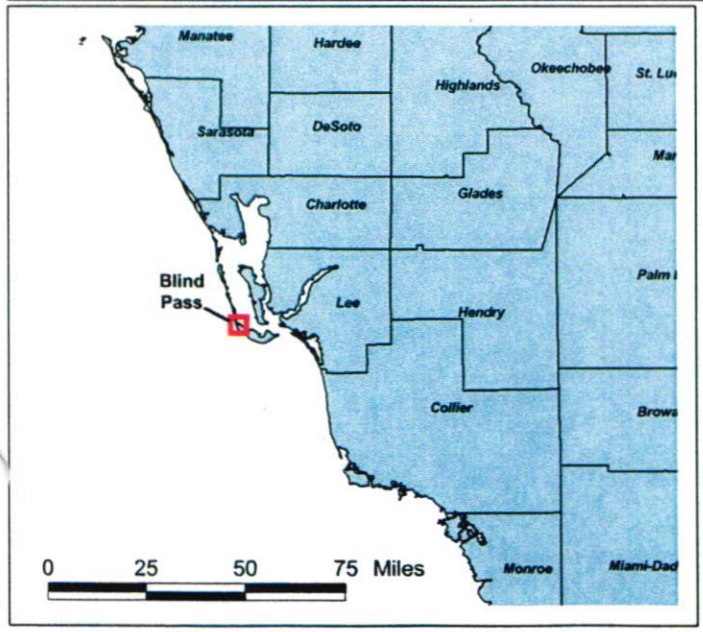
1.0 INTRODUCTION

The Blind Pass Restoration Project was developed to reopen Blind Pass (Figure 1). Comprehensive field investigations within the study area (Figure 2) were conducted to supplement available scientific data and information and provide necessary data to formulate and evaluate alternative plans to develop a recommended design to restore Blind Pass. Field investigations and literature reviews summarized in this report include wetland resource mapping and assessments, fisheries and shellfish data, benthic surveys, and protected species data.

The environmental effects of the project may require mitigation for impacts to seagrasses and mangroves. A mitigation plan, if necessary, formulated to ameliorate for these impacts, will be developed in the federal and state regulatory agency review process to acquire permits for the Project. This document will provide the technical basis and environmental specifications for future maintenance of the Pass.





Blind Pass Survey Area

Location Map	
Environmental Baseline and Impact Report Blind Pass, Lee County, FL	
Scale: 1 inch = 0.5 mile	Drawn By: MR
Date: January 2006	Approved By: LS
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	J05-828
	Figure 1

Extent of Survey Area
FDEP Range Monument
Range Monuments

750 0 750 1500 Feet

Study Area Map	
Environmental Baseline and Impact Report Blind Pass, Lee County, FL	
Scale: 1 inch = 750 feet	Drawn By: MR
Date: January 2006	Approved By: LS
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	J05-828
	Figure 2

2.0 INVESTIGATIVE METHODS

2.1 Seagrass Beds and Other Marine Habitats

During May 11-13, 2005, DC&A conducted a survey to document the distribution, occurrence, abundance, and density of seagrasses within the study area (Braun-Blanquet 1965). Additional surveys of the project area were conducted in October 2005 to better define some seagrass areas and to reflect seasonal and weather-induced variations. Although the focus of this study was to map seagrasses, occurrences of other resource types of habitats within the survey area were also recorded. Additional resource types included oyster beds, rocks, sand, marine algae, and mixed assemblages. Additional seagrass surveys were conducted by the Lee County Natural Resources Division in 2004 and by the Florida Department of Environmental Protection (FDEP) in the summer 0f 2005.

Sample design was aided by use of ArcView GIS software. Transects and targets were located in the field using Trimble navigational software, and a snorkel point-intercept survey was performed. Time of observation, water depth, species composition, and percent coverage were recorded.

2.2 Benthic Habitats

Benthic marcrofaunal analyses were also conducted in the project area according to protocol determined by the FDEP in their July 27, 2005 memo. On September 1, 2005 sixteen core samples were taken by Lee County Natural Resources Division in the vicinity of the proposed project (Figure 3). One sample was collected at each of the 16 sampling stations using a petite ponar sampler. Each sample was washed onto a sieve with a 0.5mm mesh. The material retained on the sieve was collected in a glass jar and stained in the field with Rose Bengal. Total area sampled at each location was 0.0203 meters. Samples were fixed and transferred to the laboratory for analysis down to the lowest practical identification level by Barry A. Vittor and Associates, Inc.

Extent of Survey Area
Benthic Sampling Sites

600 0 600 1200 Feet

Benthic Sampling Locations	
Environmental Baseline and Impact Report Blind Pass, Lee County, FL	
Scale: 1 inch = 600 feet	Drawn By: MR
Date: January 2006	Approved By: LS
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	J05-828
	Figure 3

2.3 Wetland Habitats

Prior to the commencement of field investigations, existing data regarding present and historic conditions of potential wetland habitats were assembled and reviewed. Current aerial photography and previously conducted studies were all used to compile preliminary maps of the terrestrial and wetland resources present within the study area.

Field surveys were conducted May 11-13, 2005 to verify the preliminary resource maps and to identify any additional environmental constraints. Areas of potential jurisdictional wetlands, particularly mangrove-vegetated wetlands were given particular attention. Presence or absence of any indicators of state or federally protected flora and fauna or their habitat was also determined.

Within the study area, intensive mapping of wetland resources was conducted. Habitats were mapped using a Trimble GeoXT Differential Geographic Positioning System (DGPS). This unit has an accuracy level of less than 1-meter. Field personnel used this method to delineated wetland, upland, and major habitat types within the area to be potentially impacted by the Preferred Alternative. Habitats outside of the area of potential impact areas were groundtruthed using DGPS and habitat types confirmed. All data collected were post-processed and incorporated in the resource maps depicted in this document.

2.4 Fish and Shellfish

Previous reports and studies regarding fish and shellfish potentially utilizing the proposed project area were reviewed prior to conducting the field investigations. Field investigations conducted May 11-13, 2005 were limited to observations during the seagrass and habitat mapping efforts.

2.5 Wildlife and Protected Species

Background research on the occurrence of protected species was conducted prior to field investigations. This included a literature search documenting occurrence of flora and fauna within the study area, as well as, direct communication with Lee County staff and other related state and federal agencies. Ongoing studies on species such as manatees and sea turtles were used to document habitat utilization by these species within the study area. Any observations by field staff regarding sightings of threatened and endangered species were also noted.

3.0 RESULTS

3.1 Seagrasses Beds and Other Marine Habitats

Seagrass mapping within the project area was originally conducted May 11-13, 2005. Preliminary maps from this time period revealed sparse *Halodule wrightii* and *Thallassia testudiumn* coverage on the shallower accreted sand portions of the study area. Conditions during this time were less than ideal. The area was still recovering from the effects of the 2004 storm season (*i.e.* turbid water, stressed seagrasses, heavy algae cover). Upon consultation with County staff, it was recommended that more mapping be conducted at the end of the summer 2005 growing season to better assess the condition of seagrasses within the proposed project area. Results of that mapping effort are shown in Figure 4. In total, there are 19.33 acres of sparse *H. wrightii* within the project area. These areas also include some scattered occurrences of *T. testudinum,* with some isolated *Ruppia maritima,* and *Halophila englemannii,* as well. Additionally, there are 3.02 acres of *T. testudinum* dominated seagrass beds present along the deeper edges and northernmost extent of the seagrass habitat. Some mixed assemblages of *H. wrightii* and *T. testudinum* also occur along the eastern edge of the study area.

The shallower portions of the seagrass beds, in particular the areas farthest south and closest to the bridge, were covered by a large amount of algae (mainly *Caulerpa* spp., *Udotea* spp., and *Pencillus* spp.) This was most likely due to the influx of nutrients and freshwater runoff following the 2004 and 2005 hurricanes. As the influence of this event fades over time, the algae cover may become less evident.

Additional marine habitats in the area east of the bridge include extensive areas of open sand and accumulated marine algae adjacent to the seagrass beds. Two oyster beds also occur within the study area and are 0.01 and 0.11 acres in size, respectively (Figure 4). Marine habitat west of the bridge was limited to the shallow, nearshore sandy bottom habitat within the gulf. No submerged vegetation was present in the shallow, nearshore area.

Extent of Survey Area

Blind Pass Habitat Community

- Halodule wrightii
- Thalassia testudinum
- Mixed seagrasses (T. testudinum, H. wrightii)
- Oyster
- Mangrove
- Fringe Mangrove
- Accreted Sands

600 0 600 1200 Feet

Habitat Community Map

Environmental Baseline and Impact Report
Blind Pass, Lee County, FL

Scale: 1 inch = 600 feet	**Drawn By: MR**
Date: April 2006	**Approved By: LS**
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	**J05-828**
	Figure 4

The project would be designed as to avoid impacting any seagrass beds or marine resources identified in this study. If seagrass resources cannot be completely avoided, impacts would be minimized and mitigation would be provided if required by the resource agencies. A recent mapping effort conducted by Lee County Natural Resources Division in July 2004 identified sparse seagrass within the a portion of the study area. Although the previously identified seagrasses were extremely sparse and consisted entirely of *H. wrightii*, subsequent surveys did not identify any seagrasses within this area. Conditions within the study area, particularly within the shallower areas nearest to the bridge are subject to rapid change due to environmental influences. Conditions within this area will most likely continue to change in the immediate future.

3.2 Benthic Analysis

Results of the benthic infaunal analysis are included in Appendix A and summarized in Table 1. In total 3,372 individuals from 50 taxa were collected over the sixteen sampling locations (Appendix A). The largest numbers of individuals collected was from Sample 5 (1162), while Sample 14 yielded the lowest number of individuals (33) (Table 1, Figure 3). Sample 5 was collected on a small, shallow area where Roosevelt Channel intersects with Wulfert Channel. Sample 14 was collected within the deeper section of Wulfert Channel along the northwestern boundary. Although Sample 5 had the largest number of individuals, it had a low Shannon index (1.53), indicating low species diversity compared to the other samples. This was due to a large percentage (58.4 percent) of the individuals consisting of the same species, *Gemma gemma*, a small bivalve. Sample 16, which was collected from the deeper channel near the northern boundary of the study area, yielded few individuals (76) but high species diversity (3.01 Shannon index). The mean density of species averaged over the entire area was 10,027/m^2. Mean density figures had a range of 1435/m^2 to 50,355/m^2. Shannon index values ranged from 1.19 to 3.01, while diversity numbers ranged from 1.72 to 4.35 (Table 1).

Table 1 Summary of Benthic Analysis

Client: ECE
Project: ECE Blind Pass
Sample Date: September 2005

Location:
Habitat: Coastal

FAUNAL PARAMETERS

Station	Date (m/d/y)	Total No. Taxa	Mean No. of Taxa per Repl.	No. of Taxa per Repl. (Std Dev)	Total No. Individuals	Mean Density (nos/m2)	Density (Std Dev)	H' Shannon (log e)	d Diversity (log 2)	1/S Simpson Diversity	J' Pielou Evenness	D Margalef Richness	e Equitability
Stn. 1	9/1/2005	10	10.0	0.0	74	3217.0	0.0	1.98	2.86	7.03	0.86	2.09	1.02
Stn. 2	9/1/2005	19	19.0	0.0	249	10826.0	0.0	2.15	3.11	6.42	0.73	3.26	0.64
Stn. 3	9/1/2005	23	23.0	0.0	376	16348.0	0.0	2.38	3.43	7.51	0.76	3.71	0.67
Stn. 4	9/1/2005	23	23.0	0.0	180	6000.0	0.0	2.35	3.40	7.03	0.75	4.24	0.65
Stn. 5	9/1/2005	36	36.0	0.0	1162	50522.0	0.0	1.53	2.21	2.55	0.43	4.96	0.18
Stn. 6	9/1/2005	20	20.0	0.0	227	9870.0	0.0	1.82	2.63	3.63	0.61	3.50	0.43
Stn. 7	9/1/2005	19	19.0	0.0	59	2565.0	0.0	2.52	3.64	9.35	0.86	4.41	0.94
Stn. 8	9/1/2005	41	41.0	0.0	174	7565.0	0.0	2.92	4.21	10.86	0.79	7.75	0.66
Stn. 9	9/1/2005	48	48.0	0.0	376	16348.0	0.0	2.50	3.61	5.74	0.65	7.93	0.37
Stn. 10	9/1/2005	12	12.0	0.0	42	1826.0	0.0	1.74	2.52	3.29	0.70	2.94	0.66
Stn. 11	9/1/2005	50	50.0	0.0	478	20783.0	0.0	2.76	3.98	6.46	0.70	7.94	0.46
Stn. 12	9/1/2005	18	18.0	0.0	70	3043.0	0.0	2.17	3.13	5.83	0.75	4.00	0.69
Stn. 13	9/1/2005	9	9.0	0.0	81	3522.0	0.0	1.19	1.72	2.55	0.54	1.82	0.50
Stn. 14	9/1/2005	11	11.0	0.0	33	1435.0	0.0	1.83	2.64	4.84	0.76	2.86	0.79
Stn. 15	9/1/2005	19	19.0	0.0	75	3261.0	0.0	2.41	3.48	8.73	0.82	4.17	0.84
Stn. 16	9/1/2005	28	28.0	0.0	76	3304.0	0.0	3.01	4.35	19.00	0.90	6.23	1.07

Benthic resources may be impacted with the project. Sample stations 1-7 are in the main portion of the existing channel, but no apparent differences between these stations and those outside of the main channel can be distinguished. Diversity values and density (Table 1) show no trends throughout the sampling area, and all samples were dominated by annelids, arthropods, and mollusks. Once the project has been constructed, it is expected that the benthic community will quickly recolonize the area.

3.3 Fish and Shellfish

Seagrass habitats along the Gulf coast of Florida typically have a high diversity of fish species present, with as many as 50 different species of fish that can be encountered within these habitats. (Vanesse Hangen Brustlin, Inc. & Steven Sauers Environmental Management 2003, FMRI 2004, Dial Cordy 2005). Common species include the hardhead catfish (*Arius felis*), crevalle jack (*Caranx hippos*), bay anchovy (*Anchoa mitchelli*), pinfish (*Lagodon rhomboides*), mojarra (*Eucinostomus* sp.) and striped mullet (*Mugil cephalus*) Other notable species typically utilizing these habitats include redfish (*Sciaenops ocellatus*), snook (*Centropomus undecimalis*), Spanish mackerel (*Scomberomorus maculatus*) and spotted seatrout (*Cynoscion nebulosus*). Many cryptic species, such as blue crabs (*Callinectes sapidus*), pipefish (*Syngnathus* sp.), gobies (family Gobiidae), and grass shrimp (*Paleomonetes* sp.) are also common in these habitats. However, few fish were observed during the site visit, and no fish were observed in the deeper waters in the northern channels and seagrass beds.

Two oyster beds were observed within the study area, as was previously discussed (Figure 4). An occasional isolated oyster specimen or small oyster clusters were observed along the mangrove roots in the deeper channels in the northern portion of the study area. Isolated occurrences of hermit crabs and fiddler crabs (*Uca* spp.) were also observed in the shallow areas adjacent to the mangrove wetlands and accreted sand flats.

Fish and shellfish resources will not likely be directly impacted by the project. Some disruption of habitat may occur with project construction, but this will be minor and temporary. Once the project has been constructed, the open channel and deeper water will likely be utilized by many fish that currently do not frequent the shallow waters near the bridge.

3.4 Wetland Habitats

Mangrove wetlands within the study area can be categorized as historically established, mature mangrove habitat and immature, recently colonized mangrove vegetation. The mature mangrove community makes up the shoreline along the borders of the study area including a narrow fringe between the established residential community on Captiva Island (Figure 4). The shoreline along the large, established islands along the channel are also mature mangrove communities.

Immature red mangrove (*Rhizophora mangle*) seedlings have also become established on the newly accreted sand that extends on the northern side of the bridge. The most recently accreted areas have the most sparsely vegetated areas and also the shortest mangrove individuals. As these established accreted sandy areas remain established, the mangrove communities will continue to grow and mature.

Coastal terrestrial habitat west of the bridge was limited to the newly accreted sand from the shoreline that extends under the bridge. Only scattered, herbaceous vegetation was present on the accreted sand, and the majority of the vegetation was present on the extreme southern edge of the project area.

Mangrove wetlands may be impacted by the project. Areas of recent sand accretion contain only sparse, immature red mangrove seedlings that have only recently colonized the area. The individual mangrove seedlings are less than 36 inches in height. The mangrove area will likely continue to grow and expand until the project has been constructed.

3.5 Wildlife and Protected Species

3.5.1 West Indian Manatee

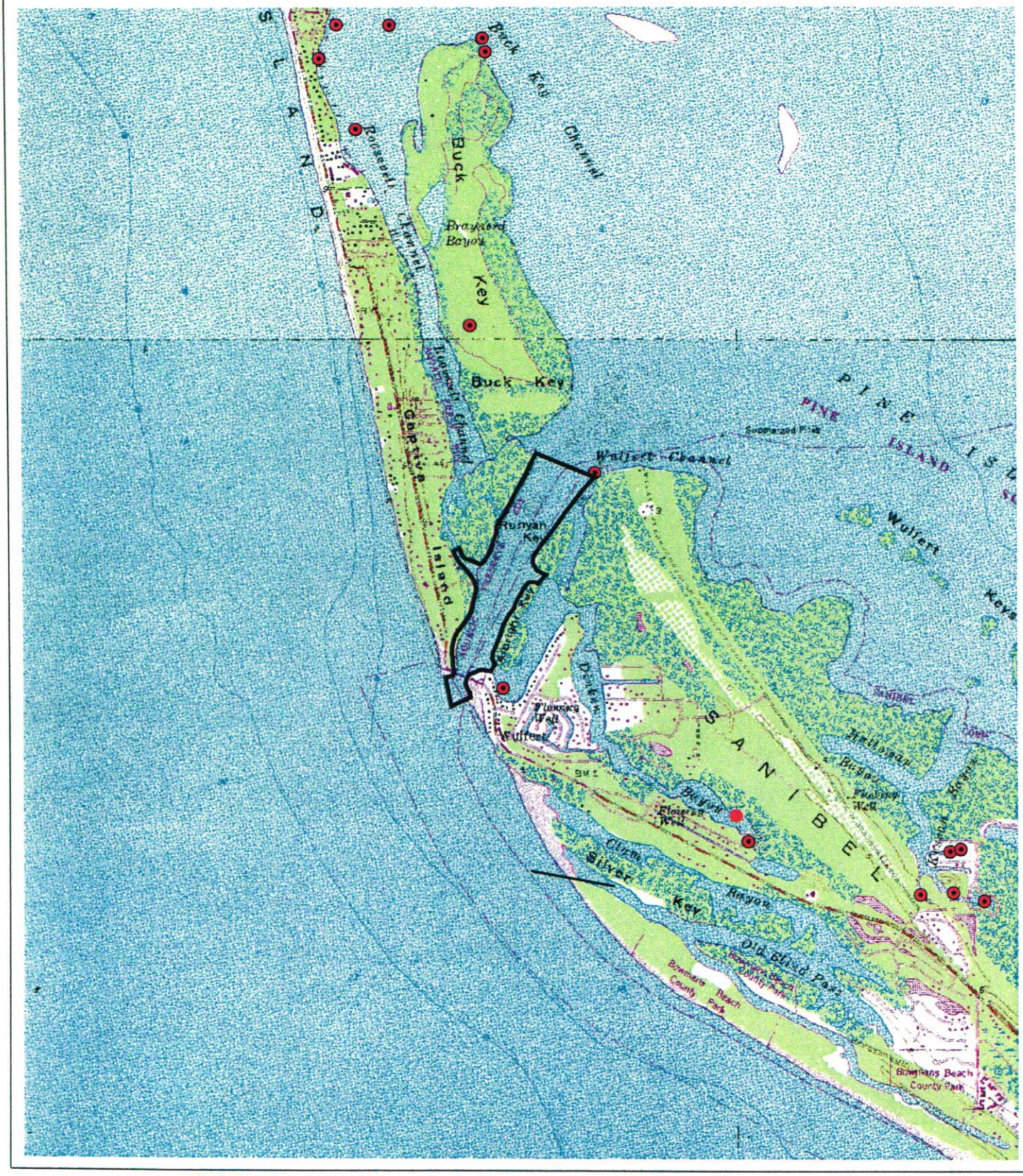
Manatee distribution in Lee County includes substantial sightings in Pine Island Sound throughout the year, but substantially lower numbers occur during the colder months (Lee County 2004) Only four reported manatee deaths were recorded near the project study area between 1976 and 2005 (Figure 5). Two of the deaths were watercraft related, while one was perinatal and one was undetermined (FMRI 2005).

Impacts to the West Indian manatee populations within the Bay are not expected. Much of the immediate project area is very shallow and not suitable for manatee utilization. Once the channel has been opened, the area may provide an additional passage between Pine Island Sound and the gulf.

Indirect impacts may occur due to additional boating traffic in the project area, but the additional traffic would only be small, recreational craft that can access the shallow channel. Blind Pass has been historically open in the past, and vessel related mortality data previously discussed has been low for this area, so it is not likely that the project will adversely affect the manatee. Appropriate protection measures will be implemented to insure the safety of any manatees within the area during construction.

3.5.2 Sea Turtles

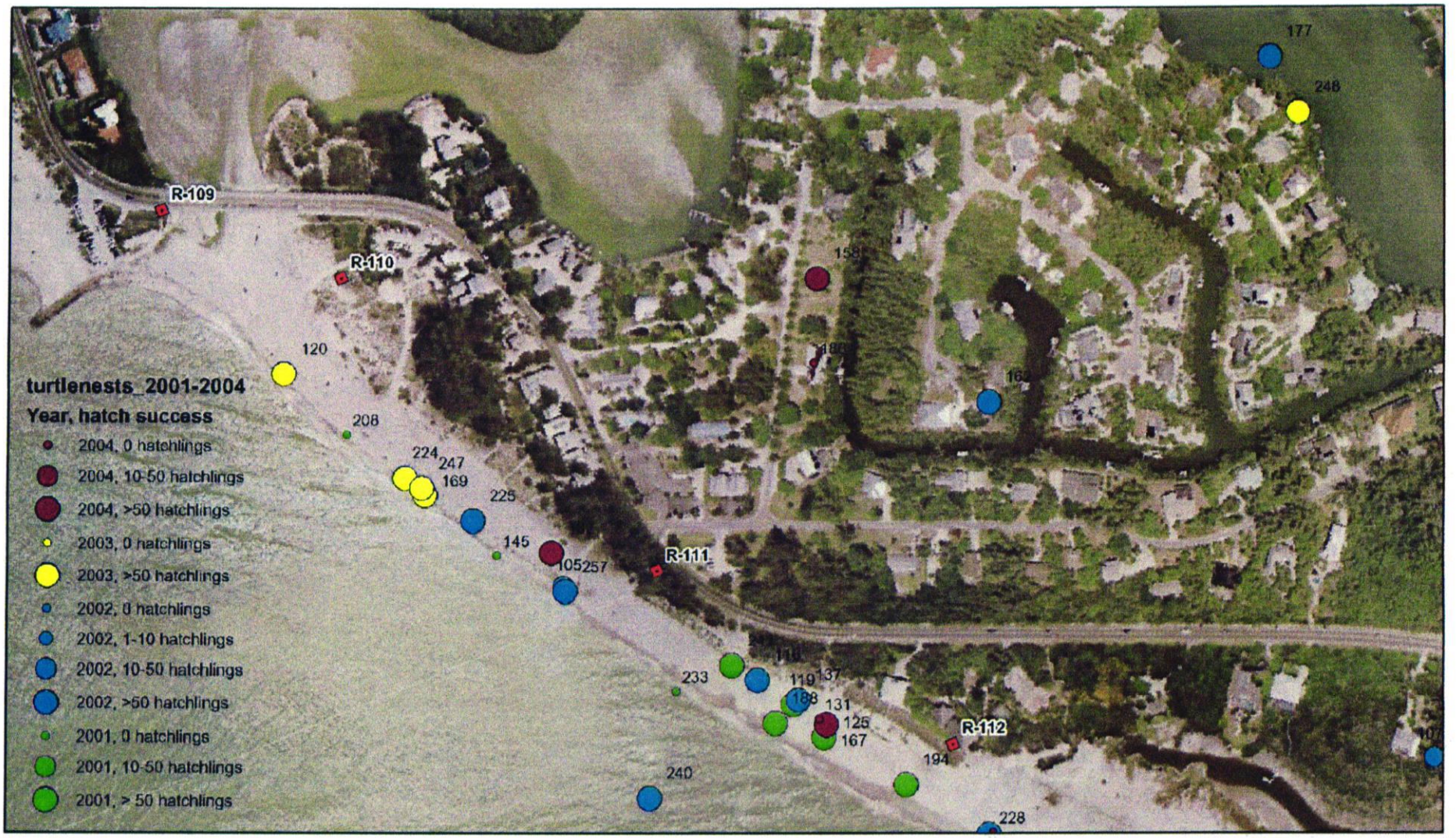
Sea turtle nesting data were provided by the Sanibel/Captiva Conservation Foundation and mapped by the Lee County Natural Resources Division. Loggerhead sea turtles frequently nest on Sanibel and Captiva Islands, and green sea turtles have also been known to nest on Lee County beaches, although in much fewer numbers. The nesting data for the years 2001 to 2004 are provided in Figure 6.



Documented Manatee Mortality	
Environmental Baseline and Impact Report Blind Pass, Lee County, FL	
Scale: 1 inch = 0.5 mile	Drawn By: MR
Date: April 2006	Approved By: LS
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	J05-828
	Figure 5

BLIND PASS PROJECT

Turtle Nesting Activity



Source: Lee County Natural Resources.
Nesting activity monitored by the
Sanibel-Captiva Conservation Foundation.

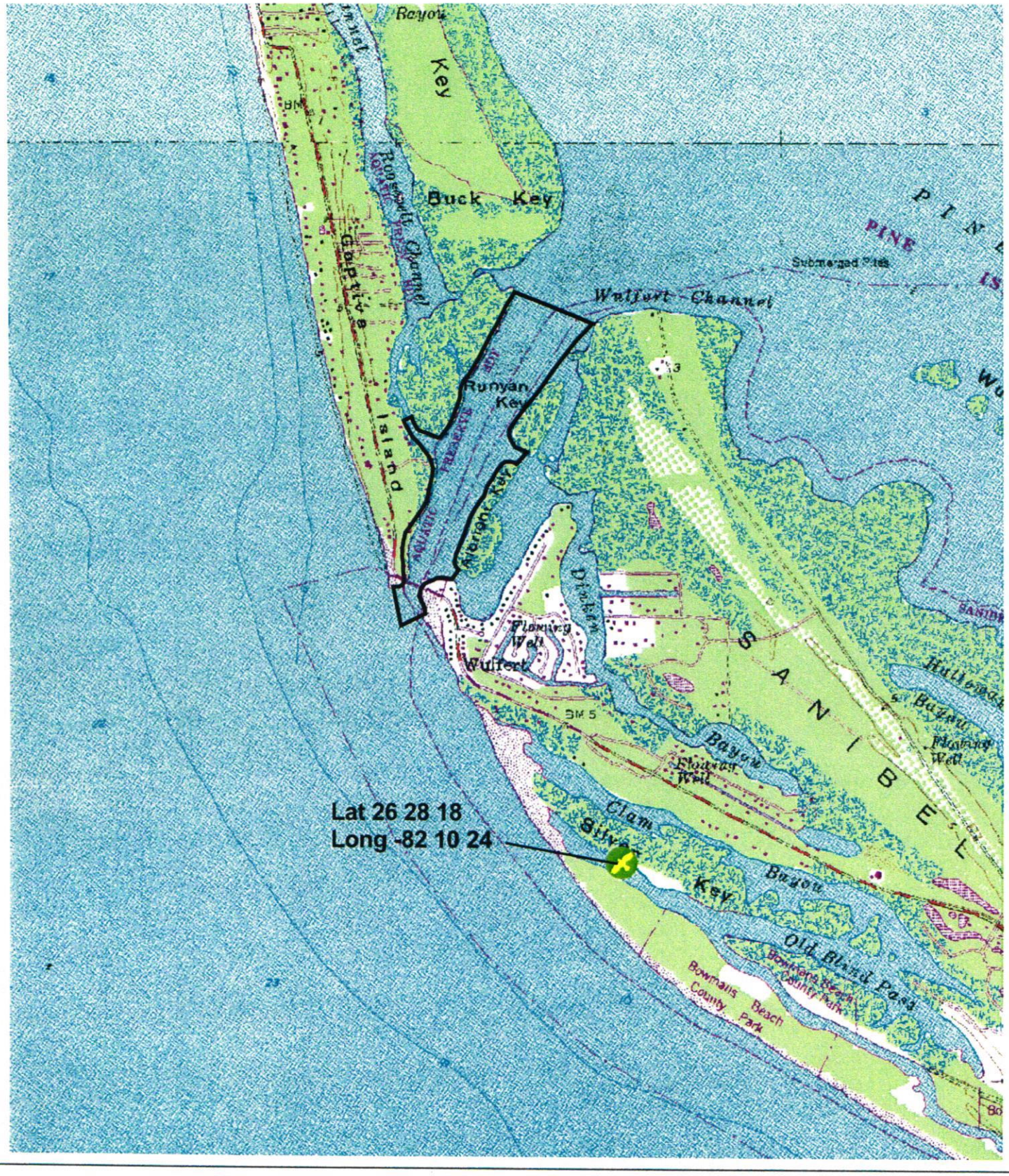
Sea Turtle Nesting	
Environmental Baseline and Impact Report Blind Pass, Lee County, FL	
Scale: as shown	Drawn By: MR
Date: January 2006	Approved By: LS
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	J05-828
	Figure 6

Sea turtles will not likely be directly affected by the project. Construction activities should occur outside of the nesting season (May 1 through October 31) as to avoid impacts to nests or nesting turtles. Potential nesting habitat may be lost with the project, although only minor nesting has occurred in the project area. The majority of the nesting in recent years has occurred south of the project.

3.5.3 Avian Species

Many wading and shorebirds forage in shallow (typically 15 cm) water with varying salinity associated with tidal flats, shoals, grassbeds, and lagoons of coastal barrier islands. Species typically utilizing this habitat included egrets, terns, gulls, plovers, and herons. Only a limited number of species and individuals (mainly egrets and herons) were observed foraging in the shallow water habitat east of the bridge. The recreational beach area was not heavily used by bird species due to their extensive use by humans. It is not likely that nesting of shorebirds occurs along the beach habitat for this reason, and therefore, the project is not likely to have any significant effect on shorebirds or wading birds.

The nearest bald eagle nest is located over 4,000 feet away and just south of the project area, and a review of the database of known bald eagle nests confirmed this location just north of Bowmans Beach (Figure 7). The project is not likely to have any effect on this species due to the proximity of the nearest nest.



Extent of Survey Area

Bald Eagle Nest Location

2000 0 2000 4000 Feet

Bald Eagle Nest Location	
Environmental Baseline and Impact Report Blind Pass, Lee County, FL	
Scale: 1 inch = 2,000 feet	Drawn By: MR
Date: April 2006	Approved By: LS
DIAL CORDY AND ASSOCIATES INC Environmental Consultants	J05-828
	Figure 7

4.0 LITERATURE CITED AND CONSULTED

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APPENDIX A

BENTHIC STUDY DATA

Station Data Summary Report
Station Stn. 1

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 001
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Station				
	Count	Density	Total	Percent	Mean Density
Annelida					
Polychaeta					
Capitellida					
Capitellidae					
Capitella capitata	11	478	11	14.9	478
Orbiniida					
Orbiniidae					
Leitoscoloplos (LPIL)	8	348	8	10.8	348
Phyllodocida					
Nereidae					
Laeonereis culveri	13	565	13	17.6	565
Arthropoda					
Malacostraca					
Amphipoda					
Aoridae					
Grandidierella bonnieroides	1	43	1	1.4	43
Tanaidacea					
Leptochelidae					
Hargeria rapax	1	43	1	1.4	43
Ostracoda					
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	9	391	9	12.2	391
Mollusca					
Bivalvia					
Veneroida					
Veneridae					
Anomalocardia auberiana	2	87	2	2.7	87
Gemma gemma	12	522	12	16.2	522
Gastropoda					
Cephalaspidea					
Scaphandridae					
Acteocina canaliculata	1	43	1	1.4	43
Neotaenioglossa					
Batillariidae					
Batillaria minima	16	696	16	21.6	696

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 001
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	10	10	10	0
Total Individuals	74	74	74	0
Density (nos/sq.m.)		3217	3217	0

FAUNAL INDICES		
Species Diversity (Shannon; log base e)	H'	1.98
Species Diversity (Shannon; log base 2)	d	2.86
Species Diversity (Shannon; log base 10)	H	0.86
Species Diversity (Simpson; 1/S)	1/S	7.03
Species Evenness (Pielou)	J'	0.86
Species Richness (Margalef)	D	2.09
Equitability Index (Lloyd & Ghelardi)	e	1.02

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	3	30	32	43.2
Mollusca	4	40	31	41.8
Arthropoda	3	30	11	14.8
TOTALS	**10**		**74**	

Station Data Summary Report
Station Stn. 2

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 002
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Count	Density	Station Total	Station Percent	Station Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	9	391	9	3.6	391
Polychaeta					
Capitellida					
Capitellidae					
Capitella capitata	43	1870	43	17.3	1870
Orbiniida					
Orbiniidae					
Leitoscoloplos (LPIL)	5	217	5	2	217
Paraonidae					
Aricidea philbinae	1	43	1	0.4	43
Phyllodocida					
Nereidae					
Laeonereis culveri	72	3130	72	28.9	3130
Terebellida					
Ampharetidae					
Hobsonia florida	2	87	2	0.8	87
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca abdita	1	43	1	0.4	43
Aoridae					
Aoridae (LPIL)	1	43	1	0.4	43
Ostracoda					
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	35	1522	35	14.1	1522
Cnidaria					
Anthozoa					
Actiniaria					
Actiniaria (LPIL)	16	696	16	6.4	696
Mollusca					
Bivalvia					
Bivalvia (LPIL)	3	130	3	1.2	130
Mytiloida					
Mytilidae					
Mytilidae (LPIL)	1	43	1	0.4	43
Veneroida					
Tellinidae					
Tellina texana	4	174	4	1.6	174
Veneridae					
Gemma gemma	25	1087	25	10	1087
Gastropoda					
Gastropoda (LPIL)	1	43	1	0.4	43
Cephalaspidea					
Scaphandridae					
Acteocina canaliculata	24	1043	24	9.6	1043
Neogastropoda					
Marginellidae					
Granulina ovuliformis	2	87	2	0.8	87
Neotaenioglossa					
Batillariidae					
Batillaria minima	1	43	1	0.4	43
Sipuncula					
Golfingiidae					
Phascolion strombi	3	130	3	1.2	130

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 2

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 002
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	19	19	19	0
Total Individuals	249	249	249	0
Density (nos/sq.m.)		10826	10826	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.15
Species Diversity (Shannon; log base 2)	d	3.11
Species Diversity (Shannon; log base 10)	H	0.93
Species Diversity (Simpson; 1/S)	1/S	6.42
Species Evenness (Pielou)	J'	0.73
Species Richness (Margalef)	D	3.26
Equitability Index (Lloyd & Ghelardi)	e	0.64

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Total	Total No. Individuals	Individuals % Total
Cnidaria	1	5.2	16	6.4
Annelida	6	31.5	132	53
Mollusca	8	42.1	61	24.4
Sipuncula	1	5.2	3	1.2
Arthropoda	3	15.7	37	14.8
TOTALS	**19**		**249**	

Station Data Summary Report
Station Stn. 3

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 003
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	9	391	9	2.4	391
Polychaeta					
Capitellida					
Capitellidae					
Capitella capitata	9	391	9	2.4	391
Maldanidae					
Maldanidae (LPIL)	13	565	13	3.5	565
Orbiniida					
Orbiniidae					
Leitoscolopios (LPIL)	29	1261	29	7.7	1261
Paraonidae					
Aricidea philbinae	2	87	2	0.5	87
Phyllodocida					
Nereidae					
Laeonereis culveri	97	4217	97	25.8	4217
Phyllodocidae					
Hypereteone fauchaldi	1	43	1	0.3	43
Terebellida					
Ampharetidae					
Hobsonia florida	13	565	13	3.5	565
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca (LPIL)	1	43	1	0.3	43
Ostracoda					
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	52	2261	52	13.8	2261
Cnidaria					
Anthozoa					
Actiniaria					
Actiniaria (LPIL)	30	1304	30	8	1304
Mollusca					
Bivalvia					
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	1	43	1	0.3	43
Veneroida					
Psammobiidae					
Psammobiidae (LPIL)	3	130	3	0.8	130
Tagelus (LPIL)	7	304	7	1.9	304
Semelidae					
Semele (LPIL)	1	43	1	0.3	43
Tellinidae					
Tellina texana	2	87	2	0.5	87
Veneridae					
Anomalocardia auberiana	13	565	13	3.5	565
Gemma gemma	66	2870	66	17.6	2870
Gastropoda					
Cephalaspidea					
Acteonidae					
Rictaxis punctostriatus	1	43	1	0.3	43
Scaphandridae					
Acteocina canaliculata	7	304	7	1.9	304
Mesogastropoda					
Rissoidae					
Rissoidae (LPIL)	2	87	2	0.5	87
Neogastropoda					
Mitridae					
Pusia gemmata	7	304	7	1.9	304
Sipuncula					
Golfingiidae					
Phascolion strombi	10	435	10	2.7	435

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 3

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 003
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	23	23	23	0
Total Individuals	376	376	376	0
Density (nos/sq.m.)		16348	16348	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.38
Species Diversity (Shannon; log base 2)	d	3.43
Species Diversity (Shannon; log base 10)	H	1.03
Species Diversity (Simpson; 1/S)	1/S	7.51
Species Evenness (Pielou)	J'	0.76
Species Richness (Margalef)	D	3.71
Equitability Index (Lloyd & Ghelardi)	e	0.67

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Total	Total No. Individuals	Individuals % Total
Cnidaria	1	4.3	30	7.9
Annelida	8	34.7	173	46
Mollusca	11	47.8	110	29.2
Sipuncula	1	4.3	10	2.6
Arthropoda	2	8.6	53	14
TOTALS	**23**		**376**	

Station Data Summary Report
Station Stn. 4

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 004
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.03

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	21	700	21	11.7	700
Polychaeta					
Capitellida					
Capitellidae					
Capitella capitata	4	133	4	2.2	133
Eunicida					
Onuphidae					
Diopatra cuprea	1	33	1	0.6	33
Orbiniida					
Orbiniidae					
Leitoscoloplos (LPIL)	7	233	7	3.9	233
Paraonidae					
Aricidea philbinae	10	333	10	5.6	333
Phyllodocida					
Nereidae					
Laeonereis culveri	54	1800	54	30	1800
Syllidae					
Sphaerosyllis piriferopsis	3	100	3	1.7	100
Spionida					
Spionidae					
Polydora cornuta	1	33	1	0.6	33
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca abdita	22	733	22	12.2	733
Cumacea					
Diastylidae					
Oxyurostylis lecroyae	1	33	1	0.6	33
Isopoda					
Anthuridae					
Cyathura polita	1	33	1	0.6	33
Tanaidacea					
Leptochelidae					
Leptochelia (LPIL)	3	100	3	1.7	100
Echinodermata					
Ophiuroidea					
Ophiurida					
Amphiuridae					
Amphiuridae (LPIL)	1	33	1	0.6	33
Mollusca					
Bivalvia					
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	24	800	24	13.3	800
Veneroida					
Semelidae					
Semele (LPIL)	2	67	2	1.1	67
Veneridae					
Anomalocardia auberiana	3	100	3	1.7	100
Gemma gemma	11	367	11	6.1	367
Gastropoda					
Cephalaspidea					
Acteonidae					
Rictaxis punctostriatus	2	67	2	1.1	67
Haminoeidae					
Atys sandersoni	2	67	2	1.1	67
Scaphandridae					
Acteocina canaliculata	3	100	3	1.7	100
Pyramidelloida					
Pyramidellidae					
Odostomia (LPIL)	2	67	2	1.1	67
Rhynchocoela					
Rhynchocoela (LPIL)	1	33	1	0.6	33
Sipuncula					
Golfingiidae					
Phascolion strombi	1	33	1	0.6	33

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 4

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 004
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.03

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	23	23	23	0
Total Individuals	180	180	180	0
Density (nos/sq.m.)		6000	6000	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.35
Species Diversity (Shannon; log base 2)	d	3.4
Species Diversity (Shannon; log base 10)	H	1.02
Species Diversity (Simpson; 1/S)	1/S	7.03
Species Evenness (Pielou)	J'	0.75
Species Richness (Margalef)	D	4.24
Equitability Index (Lloyd & Ghelardi)	e	0.65

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Rhynchocoela	1	4.3	1	0.5
Annelida	8	34.7	101	56.1
Mollusca	8	34.7	49	27.2
Sipuncula	1	4.3	1	0.5
Arthropoda	4	17.3	27	15
Echinodermata	1	4.3	1	0.5
TOTALS	**23**		**180**	

Station Data Summary Report
Station Stn. 5

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 005
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	4	174	4	0.3	174
Polychaeta					
Capitellida					
Maldanidae					
Maldanidae (LPIL)	44	1913	44	3.8	1913
Orbiniida					
Orbiniidae					
Leitoscoloplos (LPIL)	5	217	5	0.4	217
Paraonidae					
Aricidea philbinae	5	217	5	0.4	217
Phyllodocida					
Nereidae					
Laeonereis culveri	22	957	22	1.9	957
Syllidae					
Exogone rolani	2	87	2	0.2	87
Spionida					
Spionidae					
Polydora cornuta	1	43	1	0.1	43
Streblospio benedicti	1	43	1	0.1	43
Arthropoda					
Malacostraca					
Amphipoda					
Ampithoidae					
Cymadusa compta	12	522	12	1	522
Aoridae					
Grandidierella bonnieroides	3	130	3	0.3	130
Gammaridae					
Gammarus mucronatus	3	130	3	0.3	130
Cumacea					
Diastylidae					
Oxyurostylis (LPIL)	1	43	1	0.1	43
Decapoda					
Xanthidae					
Xanthidae (LPIL)	1	43	1	0.1	43
Ostracoda					
Myodocopina					
Cylindroleberididae					
Parasterope pollex	3	130	3	0.3	130
Sarsiellidae					
Eusarsiella childi	4	174	4	0.3	174
Eusarsiella zostericola	14	609	14	1.2	609
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	255	11087	255	21.9	11087
Mollusca					
Bivalvia					
Mytiloida					
Mytilidae					
Amygdalum sagittatum	1	43	1	0.1	43
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	25	1087	25	2.2	1087
Veneroida					
Cardiidae					
Laevicardium mortoni	1	43	1	0.1	43
Montacutidae					
Mysella planulata	10	435	10	0.9	435
Psammobiidae					
Tagelus plebeius	10	435	10	0.9	435
Semelidae					
Semele (LPIL)	8	348	8	0.7	348
Tellinidae					
Tellina (LPIL)	1	43	1	0.1	43
Tellina texana	4	174	4	0.3	174
Veneridae					
Anomalocardia auberiana	23	1000	23	2	1000
Chione cancellata	3	130	3	0.3	130
Gemma gemma	679	29522	679	58.4	29522
Gastropoda					
Cephalaspidea					
Acteonidae					
Rictaxis punctostriatus	1	43	1	0.1	43
Haminoeidae					
Atys sandersoni	6	261	6	0.5	261
Scaphandridae					
Acteocina canaliculata	3	130	3	0.3	130
Mesogastropoda					
Cerithiidae					
Cerithium (LPIL)	1	43	1	0.1	43
Neogastropoda					
Nassariidae					
Nassarius vibex	3	130	3	0.3	130
Turridae					
Crassispira fuscescens	1	43	1	0.1	43
Pyramidelloida					
Pyramidellidae					
Odostomia impressa	1	43	1	0.1	43
Sipuncula					
Golfingiidae					
Phascolion strombi	1	43	1	0.1	43

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 5

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 005
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	36	36	36	0
Total Individuals	1162	1162	1162	0
Density (nos/sq.m.)		50522	50522	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	1.53
Species Diversity (Shannon; log base 2)	d	2.21
Species Diversity (Shannon; log base 10)	H	0.67
Species Diversity (Simpson; 1/S)	1/S	2.55
Species Evenness (Pielou)	J'	0.43
Species Richness (Margalef)	D	4.96
Equitability Index (Lloyd & Ghelardi)	e	0.18

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Total	Total No. Individuals	Individuals % Total
Annelida	8	22.2	84	7.2
Mollusca	18	50	781	67.2
Sipuncula	1	2.7	1	0
Arthropoda	9	25	296	25.4
TOTALS	**36**		**1162**	

Station Data Summary Report
Station Stn. 6

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 006
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Polychaeta					
Capitellida					
Maldanidae					
Maldanidae (LPIL)	42	1826	42	18.5	1826
Eunicida					
Onuphidae					
Onuphidae (LPIL)	6	261	6	2.6	261
Orbiniida					
Orbiniidae					
Leitoscoloplos (LPIL)	3	130	3	1.3	130
Phyllodocida					
Phyllodocidae					
Phyllodocidae (LPIL)	1	43	1	0.4	43
Sabellida					
Sabellidae					
Fabricinuda trilobata	1	43	1	0.4	43
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca abdita	1	43	1	0.4	43
Isopoda					
Anthuridae					
Cyathura polita	1	43	1	0.4	43
Ostracoda					
Myodocopina					
Sarsiellidae					
Eusarsiella zostericola	2	87	2	0.9	87
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	108	4696	108	47.6	4696
Mollusca					
Bivalvia					
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	8	348	8	3.5	348
Veneroida					
Mactridae					
Mulinia lateralis	2	87	2	0.9	87
Psammobiidae					
Tagelus plebeius	4	174	4	1.8	174
Semelidae					
Semele (LPIL)	3	130	3	1.3	130
Veneridae					
Anomalocardia auberiana	9	391	9	4	391
Gemma gemma	26	1130	26	11.5	1130
Gastropoda					
Cephalaspidea					
Acteonidae					
Rictaxis punctostriatus	1	43	1	0.4	43
Scaphandridae					
Acteocina canaliculata	3	130	3	1.3	130
Neogastropoda					
Nassariidae					
Nassarius vibex	4	174	4	1.8	174
Pyramidelloida					
Pyramidellidae					
Odostomia (LPIL)	1	43	1	0.4	43
Sipuncula					
Golfingiidae					
Phascolion strombi	1	43	1	0.4	43

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 6

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 006
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	20	20	20	0
Total Individuals	227	227	227	0
Density (nos/sq.m.)		9870	9870	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	1.82
Species Diversity (Shannon; log base 2)	d	2.63
Species Diversity (Shannon; log base 10)	H	0.79
Species Diversity (Simpson; 1/S)	1/S	3.63
Species Evenness (Pielou)	J'	0.61
Species Richness (Margalef)	D	3.5
Equitability Index (Lloyd & Ghelardi)	e	0.43

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	5	25	53	23.3
Mollusca	10	50	61	26.8
Sipuncula	1	5	1	0.4
Arthropoda	4	20	112	49.3
TOTALS	**20**		**227**	

Station Data Summary Report
Station Stn. 7

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 007
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	4	174	4	6.8	174
Polychaeta					
Capitellida					
Maldanidae					
Maldanidae (LPIL)	1	43	1	1.7	43
Orbiniida					
Paraonidae					
Aricidea philbinae	1	43	1	1.7	43
Phyllodocida					
Goniadidae					
Glycinde solitaria	1	43	1	1.7	43
Spionida					
Magelonidae					
Magelona pettiboneae	1	43	1	1.7	43
Spionidae					
Paraprionospio pinnata	2	87	2	3.4	87
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca abdita	1	43	1	1.7	43
Ampithoidae					
Cymadusa compta	2	87	2	3.4	87
Cumacea					
Diastylidae					
Oxyurostylis lecroyae	1	43	1	1.7	43
Ostracoda					
Myodocopina					
Cylindroleberididae					
Parasterope pollex	1	43	1	1.7	43
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	3	130	3	5.1	130
Mollusca					
Bivalvia					
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	3	130	3	5.1	130
Veneroida					
Montacutidae					
Mysella planulata	5	217	5	8.5	217
Psammobiidae					
Tagelus plebeius	1	43	1	1.7	43
Tellinidae					
Tellina texana	5	217	5	8.5	217
Veneridae					
Gemma gemma	17	739	17	28.8	739
Gastropoda					
Cephalaspidea					
Hamineidae					
Atys sandersoni	4	174	4	6.8	174
Scaphandridae					
Acteocina canaliculata	2	87	2	3.4	87
Neogastropoda					
Nassariidae					
Nassarius vibex	4	174	4	6.8	174

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 7

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 007
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	19	19	19	0
Total Individuals	59	59	59	0
Density (nos/sq.m.)		2565	2565	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.52
Species Diversity (Shannon; log base 2)	d	3.64
Species Diversity (Shannon; log base 10)	H	1.1
Species Diversity (Simpson; 1/S)	1/S	9.35
Species Evenness (Pielou)	J'	0.86
Species Richness (Margalef)	D	4.41
Equitability Index (Lloyd & Ghelardi)	e	0.94

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	6	31.5	10	16.9
Mollusca	8	42.1	41	69.4
Arthropoda	5	26.3	8	13.5
TOTALS	**19**		**59**	

Station Data Summary Report
Station Stn. 8

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 008
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Polychaeta					
Capitellida					
Maldanidae					
Axiothella mucosa	1	43	1	0.6	43
Maldanidae (LPIL)	11	478	11	6.3	478
Eunicida					
Onuphidae					
Diopatra cuprea	4	174	4	2.3	174
Kinbergonuphis simoni	34	1478	34	19.5	1478
Orbiniida					
Orbiniidae					
Leitoscoloplos foliosus	1	43	1	0.6	43
Paraonidae					
Aricidea philbinae	6	261	6	3.4	261
Phyllodocida					
Hesionidae					
Podarkeopsis levifuscina	2	87	2	1.1	87
Nereidae					
Laeonereis culveri	31	1348	31	17.8	1348
Nereis succinea	2	87	2	1.1	87
Syllidae					
Syllis cornuta	1	43	1	0.6	43
Sabellida					
Sabellidae					
Chone (LPIL)	1	43	1	0.6	43
Fabricinuda trilobata	2	87	2	1.1	87
Spionida					
Magelonidae					
Magelona pettiboneae	2	87	2	1.1	87
Spionidae					
Polydora cornuta	1	43	1	0.6	43
Terebellida					
Ampharetidae					
Melinna maculata	1	43	1	0.6	43
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca cristata	1	43	1	0.6	43
Ampithoidae					
Cymadusa compta	2	87	2	1.1	87
Isopoda					
Idoteidae					
Erichsonella attenuata	3	130	3	1.7	130
Sphaeromatidae					
Harrieta faxoni	1	43	1	0.6	43
Mysidacea					
Mysidae					
Taphromysis bowmani	1	43	1	0.6	43
Ostracoda					
Myodocopina					
Sarsiellidae					
Eusarsiella zostericola	3	130	3	1.7	130
Echinodermata					
Ophiuroidea					
Ophiurida					
Ophiactidae					
Hemipholis elongata	1	43	1	0.6	43
Mollusca					
Bivalvia					
Mytiloida					
Mytilidae					
Amygdalum (LPIL)	1	43	1	0.6	43
Amygdalum sagittatum	1	43	1	0.6	43
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	3	130	3	1.7	130
Veneroida					
Montacutidae					
Mysella planulata	2	87	2	1.1	87
Neaeromya floridana	1	43	1	0.6	43
Psammobiidae					
Tagelus plebeius	1	43	1	0.6	43
Semelidae					
Semele (LPIL)	4	174	4	2.3	174
Tellinidae					
Tellina (LPIL)	3	130	3	1.7	130
Tellina texana	6	261	6	3.4	261
Veneridae					
Anomalocardia auberiana	3	130	3	1.7	130
Gemma gemma	22	957	22	12.6	957
Macrocallista maculata	1	43	1	0.6	43
Gastropoda					
Mesogastropoda					
Caecidae					
Caecum pulchellum	1	43	1	0.6	43
Cerithiidae					
Cerithium muscarum	4	174	4	2.3	174
Neogastropoda					
Columbellidae					
Mitrella lunata	1	43	1	0.6	43
Marginellidae					
Granulina ovuliformis	2	87	2	1.1	87
Marginella apicina	3	130	3	1.7	130
Pyramidelloida					
Pyramidellidae					
Turbonilla portoricana	1	43	1	0.6	43
Sipuncula					
Goifingiidae					
Phascolion strombi	2	87	2	1.1	87

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 8

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 008
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	41	41	41	0
Total Individuals	174	174	174	0
Density (nos/sq.m.)		7565	7565	0

FAUNAL INDICES		
Species Diversity (Shannon; log base e)	H'	2.92
Species Diversity (Shannon; log base 2)	d	4.21
Species Diversity (Shannon; log base 10)	H	1.27
Species Diversity (Simpson; 1/S)	1/S	10.86
Species Evenness (Pielou)	J'	0.79
Species Richness (Margalef)	D	7.75
Equitability Index (Lloyd & Ghelardi)	e	0.66

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	15	36.5	100	57.4
Mollusca	18	43.9	60	34.4
Sipuncula	1	2.4	2	1.1
Arthropoda	6	14.6	11	6.3
Echinodermata	1	2.4	1	0.5
TOTALS	**41**		**174**	

Station Data Summary Report
Station Stn. 9

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 009
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	10	435	10	2.7	435
Polychaeta					
Capitellida					
Capitellidae					
Mediomastus (LPIL)	2	87	2	0.5	87
Mediomastus ambiseta	2	87	2	0.5	87
Eunicida					
Onuphidae					
Kinbergonuphis simoni	31	1348	31	8.2	1348
Orbiniida					
Orbiniidae					
Scoloplos rubra	1	43	1	0.3	43
Phyllodocida					
Goniadidae					
Glycinde solitaria	3	130	3	0.8	130
Nereidae					
Laeonereis culveri	1	43	1	0.3	43
Syllidae					
Exogone rolani	3	130	3	0.8	130
Sylis cornuta	1	43	1	0.3	43
Sabellida					
Sabellidae					
Chone (LPIL)	1	43	1	0.3	43
Spionida					
Chaetopteridae					
Spiochaetopterus oculatus	2	87	2	0.5	87
Cirratulidae					
Monticellina dorsobranchialis	11	478	11	2.9	478
Magelonidae					
Magelona (LPIL)	1	43	1	0.3	43
Spionidae					
Paraprionospio pinnata	8	348	8	2.1	348
Prionospio cirrifera	1	43	1	0.3	43
Terebellida					
Pectinariidae					
Pectinaria gouldii	5	217	5	1.3	217
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca cristata	2	87	2	0.5	87
Cumacea					
Bodotriidae					
Cyclaspis varians	1	43	1	0.3	43
Diastylidae					
Oxyurostylis lecroyae	2	87	2	0.5	87
Decapoda					
Xanthidae					
Xanthidae (LPIL)	1	43	1	0.3	43
Mysidacea					
Mysidae					
Mysidae (LPIL)	1	43	1	0.3	43
Ostracoda					
Myodocopina					
Sarsiellidae					
Eusarsiella zostericola	1	43	1	0.3	43
Podocopida					
Cytheridaedae					
Haplocytheridea setipunctata	81	3522	81	21.5	3522
Cnidaria					
Anthozoa					
Actiniaria					
Actiniaria (LPIL)	8	348	8	2.1	348
Mollusca					
Bivalvia					
Mytiloida					
Mytilidae					
Amygdalum (LPIL)	2	87	2	0.5	87
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	3	130	3	0.8	130
Veneroida					
Lucinidae					
Lucina nassula	11	478	11	2.9	478
Lucinidae (LPIL)	1	43	1	0.3	43
Mactridae					
Mulinia lateralis	7	304	7	1.9	304
Montacutidae					
Mysella planulata	129	5609	129	34.3	5609
Naeromya floridana	2	87	2	0.5	87
Psammobiidae					
Tagelus plebeius	1	43	1	0.3	43
Semelidae					
Semele proficua	1	43	1	0.3	43
Tellinidae					
Tellina (LPIL)	1	43	1	0.3	43
Tellina sybaritica	1	43	1	0.3	43
Veneridae					
Anomalocardia auberiana	2	87	2	0.5	87
Chione cancellata	1	43	1	0.3	43
Gemma gemma	6	261	6	1.6	261
Gastropoda					
Cephalaspidea					
Haminoeidae					
Atys sandersoni	6	261	6	1.6	261
Scaphandridae					
Acteocina canaliculata	6	261	6	1.6	261
Mesogastropoda					
Caecidae					
Caecum pulchellum	1	43	1	0.3	43
Cerithiidae					
Bittiolum varium	1	43	1	0.3	43
Vitrinellidae					
Teinostoma (LPIL)	2	87	2	0.5	87
Neogastropoda					
Columbellidae					
Mitrella lunata	1	43	1	0.3	43
Nassariidae					
Nassarius (LPIL)	1	43	1	0.3	43
Nassarius vibex	6	261	6	1.6	261
Pyramidelloida					
Pyramidellidae					
Odostomia laevigata	2	87	2	0.5	87
Rhynchocoela					
Rhynchocoela (LPIL)	2	87	2	0.5	87

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 9

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 009
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	48	48	48	0
Total Individuals	376	376	376	0
Density (nos/sq.m.)		16348	16348	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.5
Species Diversity (Shannon; log base 2)	d	3.61
Species Diversity (Shannon; log base 10)	H	1.09
Species Diversity (Simpson; 1/S)	1/S	5.74
Species Evenness (Pielou)	J'	0.65
Species Richness (Margalef)	D	7.93
Equitability Index (Lloyd & Ghelardi)	e	0.37

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Total	Total No. Individuals	Individuals % Total
Cnidaria	1	2	8	2.1
Rhynchocoela	1	2	2	0.5
Annelida	16	33.3	83	22
Mollusca	23	47.9	194	51.5
Arthropoda	7	14.5	89	23.6
TOTALS	**48**		**376**	

Station Data Summary Report
Station Stn. 10

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 010
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Station				
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	2	87	2	4.8	87
Polychaeta					
Eunicida					
Onuphidae					
Kinbergonuphis simoni	2	87	2	4.8	87
Onuphidae (LPIL)	23	1000	23	54.8	1000
Phyllodocida					
Syllidae					
Exogone rolani	2	87	2	4.8	87
Spionida					
Cirratulidae					
Tharyx acutus	1	43	1	2.4	43
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca cristata	3	130	3	7.1	130
Mollusca					
Bivalvia					
Veneroida					
Mactridae					
Mulinia lateralis	1	43	1	2.4	43
Montacutidae					
Neaeromya floridana	1	43	1	2.4	43
Psammobiidae					
Tagelus plebeius	2	87	2	4.8	87
Semelidae					
Semele proficua	2	87	2	4.8	87
Veneridae					
Chione cancellata	2	87	2	4.8	87
Gastropoda					
Mesogastropoda					
Caecidae					
Caecum pulchellum	1	43	1	2.4	43

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 10

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 010
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	12	12	12	0
Total Individuals	42	42	42	0
Density (nos/sq.m.)		1826	1826	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	1.74
Species Diversity (Shannon; log base 2)	d	2.52
Species Diversity (Shannon; log base 10)	H	0.76
Species Diversity (Simpson; 1/S)	1/S	3.29
Species Evenness (Pielou)	J'	0.7
Species Richness (Margalef)	D	2.94
Equitability Index (Lloyd & Ghelardi)	e	0.66

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	5	41.6	30	71.4
Mollusca	6	50	9	21.4
Arthropoda	1	8.3	3	7.1
TOTALS	**12**		**42**	

Station Data Summary Report
Station Stn. 11
Page 1

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 011
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	17	739	17	3.6	739
Polychaeta					
Capitellida					
Capitellidae					
Mediomastus ambiseta	2	87	2	0.4	87
Eunicida					
Onuphidae					
Kinbergonuphis simoni	8	348	8	1.7	348
Orbiniida					
Orbiniidae					
Leitoscoloplos robustus	1	43	1	0.2	43
Paraonidae					
Cirrophorus lyra	1	43	1	0.2	43
Phyllodocida					
Goniadidae					
Glycinde solitaria	2	87	2	0.4	87
Nereidae					
Laeonereis culveri	1	43	1	0.2	43
Syllidae					
Exogone rolani	1	43	1	0.2	43
Sabellida					
Sabellidae					
Chone (LPIL)	1	43	1	0.2	43
Spionida					
Poecilochaetidae					
Poecilochaetus johnsoni	1	43	1	0.2	43
Spionidae					
Paraprionospio pinnata	1	43	1	0.2	43
Prionospio (LPIL)	2	87	2	0.4	87
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca (LPIL)	3	130	3	0.6	130
Ampelisca cristata	3	130	3	0.6	130
Ischyroceridae					
Cerapus benthophilus	9	391	9	1.9	391
Lilyeborgiidae					
Listriella barnardi	1	43	1	0.2	43
Cumacea					
Diastylidae					
Oxyurostylis lecroyae	2	87	2	0.4	87
Isopoda					
Idoteidae					
Edotia triloba	2	87	2	0.4	87
Mysidacea					
Mysidae					
Americamysis almyra	5	217	5	1	217
Mysidae (LPIL)	1	43	1	0.2	43
Tanaidacea					
Leptocheliidae					
Hargeria rapax	1	43	1	0.2	43
Ostracoda					
Myodocopina					
Cylindroleberidideae					
Parasterope pollex	16	696	16	3.3	696
Sarsiellidae					
Eusarsiella childi	4	174	4	0.8	174
Eusarsiella zostericola	37	1609	37	7.7	1609
Podocopida					
Cytheridaedae					
Haplocytheridea setipunctata	176	7652	176	36.8	7652
Echinodermata					
Ophiuroidea					
Ophiurida					
Ophiactidae					
Hemipholis elongata	5	217	5	1	217
Mollusca					
Bivalvia					
Mytiloida					
Mytilidae					
Amygdalum (LPIL)	2	87	2	0.4	87
Pholadomyoida					
Lyonsiidae					
Lyonsia hyalina	23	1000	23	4.8	1000
Veneroida					
Cardiidae					
Laevicardium mortoni	3	130	3	0.6	130
Lucinidae					
Lucina (LPIL)	3	130	3	0.6	130
Lucina nassula	9	391	9	1.9	391
Mactridae					
Mulinia lateralis	9	391	9	1.9	391
Montacutidae					
Mysella planulata	15	652	15	3.1	652
Psammobiidae					
Tagelus plebeius	31	1348	31	6.5	1348
Semelidae					
Semele (LPIL)	5	217	5	1	217
Semele proficua	2	87	2	0.4	87
Tellinidae					
Tellina (LPIL)	1	43	1	0.2	43
Tellina sybaritica	1	43	1	0.2	43
Veneridae					
Anomalocardia auberiana	7	304	7	1.5	304
Chione cancellata	1	43	1	0.2	43
Gemma gemma	17	739	17	3.6	739
Gastropoda					
Cephalaspidea					
Haminoeidae					
Atys sandersoni	10	435	10	2.1	435
Scaphandridae					
Acteocina canaliculata	5	217	5	1	217
Mesogastropoda					
Caecidae					
Caecum pulchellum	12	522	12	2.5	522
Neogastropoda					
Columbellidae					
Mitrella lunata	6	261	6	1.3	261
Nassariidae					
Nassarius vibex	4	174	4	0.8	174
Neotaenioglossa					
Batillariidae					
Batillaria minima	1	43	1	0.2	43
Pyramidelloida					
Pyramidellidae					
Odostomia laevigata	4	174	4	0.8	174
Rhynchocoela					
Rhynchocoela (LPIL)	2	87	2	0.4	87
Sipuncula					
Golfingiidae					
Phascolion strombi	2	87	2	0.4	87

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 11

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 011
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	50	50	50	0
Total Individuals	478	478	478	0
Density (nos/sq.m.)		20783	20783	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.76
Species Diversity (Shannon; log base 2)	d	3.98
Species Diversity (Shannon; log base 10)	H	1.2
Species Diversity (Simpson; 1/S)	1/S	6.46
Species Evenness (Pielou)	J'	0.7
Species Richness (Margalef)	D	7.94
Equitability Index (Lloyd & Ghelardi)	e	0.46

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Total	Total No. Individuals	Individuals % Total
Rhynchocoela	1	2	2	0.4
Annelida	12	24	38	7.9
Mollusca	22	44	171	35.7
Sipuncula	1	2	2	0.4
Arthropoda	13	26	260	54.3
Echinodermata	1	2	5	1
TOTALS	**50**		**478**	

Station Data Summary Report
Station Stn. 12

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 012
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Polychaeta					
Eunicida					
Onuphidae					
Kinbergonuphis simoni	1	43	1	1.4	43
Orbiniida					
Orbiniidae					
Scoloplos rubra	1	43	1	1.4	43
Paraonidae					
Aricidea philbinae	1	43	1	1.4	43
Phyllodocida					
Syllidae					
Sphaerosyllis piriferopsis	1	43	1	1.4	43
Syllis cornuta	1	43	1	1.4	43
Spionida					
Spionidae					
Paraprionospio pinnata	3	130	3	4.3	130
Prionospio (LPIL)	2	87	2	2.9	87
Arthropoda					
Ostracoda					
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	24	1043	24	34.3	1043
Mollusca					
Bivalvia					
Veneroida					
Lucinidae					
Lucina nassula	1	43	1	1.4	43
Mactridae					
Mulinia lateralis	1	43	1	1.4	43
Montacutidae					
Mysella planulata	3	130	3	4.3	130
Psammobiidae					
Tagelus plebeius	1	43	1	1.4	43
Tellinidae					
Macoma tenta	1	43	1	1.4	43
Tellina texana	1	43	1	1.4	43
Veneridae					
Gemma gemma	9	391	9	12.9	391
Gastropoda					
Cephalaspidea					
Hamineidae					
Atys sandersoni	14	609	14	20	609
Scaphandridae					
Acteocina canaliculata	2	87	2	2.9	87
Pyramidelloida					
Pyramidellidae					
Odostomia laevigata	3	130	3	4.3	130

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 12

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 012
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	18	18	18	0
Total Individuals	70	70	70	0
Density (nos/sq.m.)		3043	3043	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.17
Species Diversity (Shannon; log base 2)	d	3.13
Species Diversity (Shannon; log base 10)	H	0.94
Species Diversity (Simpson; 1/S)	1/S	5.83
Species Evenness (Pielou)	J'	0.75
Species Richness (Margalef)	D	4
Equitability Index (Lloyd & Ghelardi)	e	0.69

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	7	38.8	10	14.2
Mollusca	10	55.5	36	51.4
Arthropoda	1	5.5	24	34.2
TOTALS	**18**		**70**	

Station Data Summary Report
Station Stn. 13

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 013
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Station				
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	29	1261	29	35.8	1261
Polychaeta					
Phyllodocida					
Nereidae					
Laeonereis culveri	1	43	1	1.2	43
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca cristata	42	1826	42	51.9	1826
Ostracoda					
Myodocopina					
Cylindroleberididae					
Parasterope pollex	1	43	1	1.2	43
Sarsiellidae					
Eusarsiella zostericola	1	43	1	1.2	43
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	2	87	2	2.5	87
Mollusca					
Bivalvia					
Veneroida					
Veneridae					
Gemma gemma	3	130	3	3.7	130
Gastropoda					
Cephalaspidea					
Hamineidae					
Atys sandersoni	1	43	1	1.2	43
Neogastropoda					
Nassariidae					
Nassarius vibex	1	43	1	1.2	43

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 13

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 013
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	9	9	9	0
Total Individuals	81	81	81	0
Density (nos/sq.m.)		3522	3522	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	1.19
Species Diversity (Shannon; log base 2)	d	1.72
Species Diversity (Shannon; log base 10)	H	0.52
Species Diversity (Simpson; 1/S)	1/S	2.55
Species Evenness (Pielou)	J'	0.54
Species Richness (Margalef)	D	1.82
Equitability Index (Lloyd & Ghelardi)	e	0.5

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	2	22.2	30	37
Mollusca	3	33.3	5	6.1
Arthropoda	4	44.4	46	56.7
TOTALS	**9**		**81**	

Station Data Summary Report
Station Stn. 14

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 014
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	5	217	5	15.2	217
Polychaeta					
Capitellida					
Capitellidae					
Mediomastus ambiseta	1	43	1	3	43
Spionida					
Spionidae					
Paraprionospio pinnata	1	43	1	3	43
Arthropoda					
Malacostraca					
Amphipoda					
Ampeliscidae					
Ampelisca cristata	1	43	1	3	43
Ostracoda					
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	13	565	13	39.4	565
Cnidaria					
Anthozoa					
Actiniaria					
Actiniaria (LPIL)	1	43	1	3	43
Mollusca					
Bivalvia					
Veneroida					
Montacutidae					
Mysella planulata	1	43	1	3	43
Tellinidae					
Tellina texana	1	43	1	3	43
Veneridae					
Gemma gemma	7	304	7	21.2	304
Gastropoda					
Cephalaspidea					
Scaphandridae					
Acteocina canaliculata	1	43	1	3	43
Sipuncula					
Golfingiidae					
Phascolion strombi	1	43	1	3	43

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 14

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 014
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	11	11	11	0
Total Individuals	33	33	33	0
Density (nos/sq.m.)		1435	1435	0

FAUNAL INDICES		
Species Diversity (Shannon; log base e)	H'	1.83
Species Diversity (Shannon; log base 2)	d	2.64
Species Diversity (Shannon; log base 10)	H	0.79
Species Diversity (Simpson; 1/S)	1/S	4.84
Species Evenness (Pielou)	J'	0.76
Species Richness (Margalef)	D	2.86
Equitability Index (Lloyd & Ghelardi)	e	0.79

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Cnidaria	1	9	1	3
Annelida	3	27.2	7	21.2
Mollusca	4	36.3	10	30.3
Sipuncula	1	9	1	3
Arthropoda	2	18.1	14	42.4
TOTALS	**11**		**33**	

Station Data Summary Report
Station Stn. 15

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 015
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	17	739	17	22.7	739
Polychaeta					
Capitellida					
Capitellidae					
Mediomastus ambiseta	1	43	1	1.3	43
Eunicida					
Oenonidae					
Drilonereis longa	1	43	1	1.3	43
Orbiniida					
Paraonidae					
Aricidea philbinae	1	43	1	1.3	43
Phyllodocida					
Goniadidae					
Glycinde solitaria	2	87	2	2.7	87
Spionida					
Cirratulidae					
Monticellina dorsobranchialis	6	261	6	8	261
Spionidae					
Paraprionospio pinnata	11	478	11	14.7	478
Arthropoda					
Ostracoda					
Myodocopina					
Cylindroleberididae					
Parasterope pollex	1	43	1	1.3	43
Sarsiellidae					
Eusarsiella zostericola	2	87	2	2.7	87
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	3	130	3	4	130
Cnidaria					
Anthozoa					
Actiniaria					
Actiniaria (LPIL)	1	43	1	1.3	43
Mollusca					
Bivalvia					
Veneroida					
Lucinidae					
Lucina nassula	1	43	1	1.3	43
Tellinidae					
Tellina (LPIL)	1	43	1	1.3	43
Veneridae					
Anomalocardia auberiana	1	43	1	1.3	43
Gastropoda					
Cephalaspidea					
Hamineidae					
Atys sandersoni	14	609	14	18.7	609
Scaphandridae					
Acteocina canaliculata	3	130	3	4	130
Neogastropoda					
Nassariidae					
Nassarius vibex	5	217	5	6.7	217
Rhynchocoela					
Rhynchocoela (LPIL)	1	43	1	1.3	43
Sipuncula					
Golfingiidae					
Phascolion strombi	3	130	3	4	130

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 15

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 015
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	19	19	19	0
Total Individuals	75	75	75	0
Density (nos/sq.m.)		3261	3261	0

FAUNAL INDICES

Species Diversity (Shannon; log base e)	H'	2.41
Species Diversity (Shannon; log base 2)	d	3.48
Species Diversity (Shannon; log base 10)	H	1.05
Species Diversity (Simpson; 1/S)	1/S	8.73
Species Evenness (Pielou)	J'	0.82
Species Richness (Margalef)	D	4.17
Equitability Index (Lloyd & Ghelardi)	e	0.84

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Cnidaria	1	5.2	1	1.3
Rhynchocoela	1	5.2	1	1.3
Annelida	7	36.8	39	52
Mollusca	6	31.5	25	33.3
Sipuncula	1	5.2	3	4
Arthropoda	3	15.7	6	8
TOTALS	**19**		**75**	

Station Data Summary Report
Station Stn. 16

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 016
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

TAXON	Rep 1		Station		
	Count	Density	Total	Percent	Mean Density
Annelida					
Oligochaeta					
Tubificida					
Tubificidae					
Tubificidae (LPIL)	3	130	3	3.9	130
Polychaeta					
Orbiniida					
Orbiniidae					
Scoloplos rubra	1	43	1	1.3	43
Phyllodocida					
Goniadidae					
Glycinde solitaria	2	87	2	2.6	87
Nephtyidae					
Aglaophamus verrilli	1	43	1	1.3	43
Sigalionidae					
Sthenelais sp. A	1	43	1	1.3	43
Spionida					
Chaetopteridae					
Spiochaetopterus oculatus	1	43	1	1.3	43
Cirratulidae					
Monticellina dorsobranchialis	2	87	2	2.6	87
Spionidae					
Paraprionospio pinnata	2	87	2	2.6	87
Arthropoda					
Malacostraca					
Amphipoda					
Ampithoidae					
Cymadusa compta	2	87	2	2.6	87
Bateidae					
Batea catharinensis	10	435	10	13.2	435
Liljeborgiidae					
Listriella barnardi	1	43	1	1.3	43
Isopoda					
Anthuridae					
Amakusanthura magnifica	1	43	1	1.3	43
Ostracoda					
Myodocopina					
Cylindroleberididae					
Parasterope pollex	2	87	2	2.6	87
Podocopida					
Cytherideidae					
Haplocytheridea setipunctata	8	348	8	10.5	348
Mollusca					
Bivalvia					
Veneroida					
Lucinidae					
Lucina (LPIL)	1	43	1	1.3	43
Lucina nassula	9	391	9	11.8	391
Mactridae					
Mulinia lateralis	4	174	4	5.3	174
Montacutidae					
Mysella planulata	6	261	6	7.9	261
Psammobiidae					
Tagelus plebeius	2	87	2	2.6	87
Tellinidae					
Macoma tenta	1	43	1	1.3	43
Veneridae					
Gemma gemma	3	130	3	3.9	130
Gastropoda					
Cephalaspidea					
Haminoeidae					
Atys sandersoni	3	130	3	3.9	130
Scaphandridae					
Acteocina canaliculata	1	43	1	1.3	43
Mesogastropoda					
Cerithiidae					
Cerithium (LPIL)	1	43	1	1.3	43
Neogastropoda					
Columbellidae					
Mitrella lunata	3	130	3	3.9	130
Marginellidae					
Marginella apicina	1	43	1	1.3	43
Pyramidelloida					
Pyramidellidae					
Turbonilla portoricana	2	87	2	2.6	87
Sipuncula					
Golfingiidae					
Phascolion strombi	2	87	2	2.6	87

Note: LPIL designates the LOWEST PRACTICAL IDENTIFICATION LEVEL

Station Data Summary Report
Station Stn. 16

Client: ECE
Project: ECE Blind Pass
Location:
Sample Date: 9/1/05

BVA Station: 016
Sample Type: Macrofauna
Replicates: 1
Sample Area: 0.0230

DATA SUMMARY

FAUNAL PARAMETERS	Station	Rep 1	Mean	Std Dev
Total Taxa	28	28	28	0
Total Individuals	76	76	76	0
Density (nos/sq.m.)		3304	3304	0

FAUNAL INDICES		
Species Diversity (Shannon; log base e)	H'	3.01
Species Diversity (Shannon; log base 2)	d	4.35
Species Diversity (Shannon; log base 10)	H	1.31
Species Diversity (Simpson; 1/S)	1/S	19
Species Evenness (Pielou)	J'	0.9
Species Richness (Margalef)	D	6.23
Equitability Index (Lloyd & Ghelardi)	e	1.07

MAJOR TAXONOMIC GROUPS	Total No. Taxa	Taxa % Tota	Total No. Individuals	Individuals % Total
Annelida	8	28.5	13	17.1
Mollusca	13	46.4	37	48.6
Sipuncula	1	3.5	2	2.6
Arthropoda	6	21.4	24	31.5
TOTALS	**28**		**76**	

SUMMARY OF COMMUNITY PARAMETERS

Client: ECE
Project: ECE Blind Pass
Sample Date: September 2005

Location:
Habitat: Coastal

FAUNAL PARAMETERS

Station	Date (m/d/y)	Total No. Taxa	Mean No. of Taxa per Repl.	No. of Taxa per Repl. (Std Dev)	Total No. Individuals	Mean Density (nos/m2)	Density (Std Dev)	H' Shannon (log e)	d Diversity (log 2)	1/S Simpson Diversity	J' Pielou Evenness	D Margalef Richness	e Equitability
Stn. 1	9/1/2005	10	10.0	0.0	74	3217.0	0.0	1.98	2.86	7.03	0.86	2.09	1.02
Stn. 2	9/1/2005	19	19.0	0.0	249	10826.0	0.0	2.15	3.11	6.42	0.73	3.26	0.64
Stn. 3	9/1/2005	23	23.0	0.0	376	16348.0	0.0	2.38	3.43	7.51	0.76	3.71	0.67
Stn. 4	9/1/2005	23	23.0	0.0	180	6000.0	0.0	2.35	3.40	7.03	0.75	4.24	0.65
Stn. 5	9/1/2005	36	36.0	0.0	1162	50522.0	0.0	1.53	2.21	2.55	0.43	4.96	0.18
Stn. 6	9/1/2005	20	20.0	0.0	227	9870.0	0.0	1.82	2.63	3.63	0.61	3.50	0.43
Stn. 7	9/1/2005	19	19.0	0.0	59	2565.0	0.0	2.52	3.64	9.35	0.86	4.41	0.94
Stn. 8	9/1/2005	41	41.0	0.0	174	7565.0	0.0	2.92	4.21	10.86	0.79	7.75	0.66
Stn. 9	9/1/2005	48	48.0	0.0	376	16348.0	0.0	2.50	3.61	5.74	0.65	7.93	0.37
Stn. 10	9/1/2005	12	12.0	0.0	42	1826.0	0.0	1.74	2.52	3.29	0.70	2.94	0.66
Stn. 11	9/1/2005	50	50.0	0.0	478	20783.0	0.0	2.76	3.98	6.46	0.70	7.94	0.46
Stn. 12	9/1/2005	18	18.0	0.0	70	3043.0	0.0	2.17	3.13	5.83	0.75	4.00	0.69
Stn. 13	9/1/2005	9	9.0	0.0	81	3522.0	0.0	1.19	1.72	2.55	0.54	1.82	0.50
Stn. 14	9/1/2005	11	11.0	0.0	33	1435.0	0.0	1.83	2.64	4.84	0.76	2.86	0.79
Stn. 15	9/1/2005	19	19.0	0.0	75	3261.0	0.0	2.41	3.48	8.73	0.82	4.17	0.84
Stn. 16	9/1/2005	28	28.0	0.0	76	3304.0	0.0	3.01	4.35	19.00	0.90	6.23	1.07

Project Number: 01 038
Project Title: ECE Blind Pass

Client Name: ECE
Project Date Sep-05
BVA Date: 10/14/2005
Habitat Type: Coastal
Area:
Hydrogaphic Region:
State:
Country:

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0101	3101050101	Capitella capitata	11
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0599	3101240599	Leitoscoloplos (LPIL)	8
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	13
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	12
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	2
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	1
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neotaenioglossa	Batillariidae	3402 2101 0101		Batillaria minima	16
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Aoridae	4501 0107 0101	3706121301	Grandidierella bonnieroid	1
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Tanaidacea	Leptochelidae	4501 0803 0401		Hargeria rapax	1
Stn. 1	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	9
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Cnidaria	Anthozoa	Actiniaria		1302 0100 0099	102000099	Actiniaria (LPIL)	16
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0101	3101050101	Capitella capitata	43
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0599	3101240599	Leitoscoloplos (LPIL)	5
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	1
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	72
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Terebellida	Ampharetidae	3101 1701 0301		Hobsonia florida	2
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	9
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia			3401 0000 0099	3401000099	Bivalvia (LPIL)	3
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Mytiloida	Mytilidae	3401 0401 0099	3401060099	Mytilidae (LPIL)	1
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	4
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	25
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda			3402 0000 0099	3402000099	Gastropoda (LPIL)	1
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	24
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Marginellidae	3402 0706 0101	3402380101	Granulina ovuliformis	2
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neotaenioglossa	Batillariidae	3402 2101 0101		Batillaria minima	1
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	3
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0101	3706040101	Ampelisca abdita	1
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Aoridae	4501 0107 0099	3706120099	Aoridae (LPIL)	1
Stn. 2	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	35
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Cnidaria	Anthozoa	Actiniaria		1302 0100 0099	102000099	Actiniaria (LPIL)	30
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0101	3101050101	Capitella capitata	9
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Maldanidae	3101 0303 0099	3101170099	Maldanidae (LPIL)	13
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0599	3101240599	Leitoscoloplos (LPIL)	29
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	2
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	97
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	3101 1212 1803		Hypereteone fauchaldi	1
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Terebellida	Ampharetidae	3101 1701 0301		Hobsonia florida	13
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	9
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	1
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0099	3401180101	Psammobiidae (LPIL)	3
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0199	3401180102	Tagelus (LPIL)	7
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0299	3401020203	Semele (LPIL)	1
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	2
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	66
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	13
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Acteonidae	3402 0401 0301	3402070301	Rictaxis punctostriatus	1
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	7
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Rissoidae	3402 0619 0099	3402420099	Rissoidae (LPIL)	2
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Mitridae	3402 0708 0201		Pusia gemmata	7

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	10
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0199	3706040199	Ampelisca (LPIL)	1
Stn. 3	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	52
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Rhynchocoela				1700 0000 0099	700000099	Rhynchocoela (LPIL)	1
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0101	3101050101	Capitella capitata	4
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0101	3101220101	Diopatra cuprea	1
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0599	3101240599	Leitoscoloplos (LPIL)	7
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	10
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	54
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 0305	3101340305	Sphaerosyllis piriferopsis	3
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0412	3101330412	Polydora cornuta	1
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	21
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	24
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0299	3401020203	Semele (LPIL)	2
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	11
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	3
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Gastropoda	Cephalaspidea	Acteonidae	3402 0401 0301	3402070301	Rictaxis punctostriatus	2
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Gastropoda	Cephalaspidea	Hamineidae	3402 0403 0201	3402780202	Atys sandersoni	2
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	3
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0299	3402150299	Odostomia (LPIL)	2
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	1
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0101	3706040101	Ampelisca abdita	22
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Arthropoda	Malacostraca	Cumacea	Diastylidae	4501 0202 0113	3710040499	Oxyurostylis lecroyae	1
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Arthropoda	Malacostraca	Isopoda	Anthuridae	4501 0402 0101	3705010101	Cyathura polita	1
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Arthropoda	Malacostraca	Tanaidacea	Leptocheliidae	4501 0803 0199		Leptochelia (LPIL)	3
Stn. 4	9/1/2005			Macrofauna	Petite Ponar	0.03	Echinodermata	Ophiuroidea	Ophiurida	Amphiuridae	5301 0101 0099	4801010099	Amphiuridae (LPIL)	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Maldanidae	3101 0303 0099	3101170099	Maldanidae (LPIL)	44
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0599	3101240599	Leitoscoloplos (LPIL)	5
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	5
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	22
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 1126	3101341126	Exogone rolani	2
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0412	3101330412	Polydora cornuta	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0801	3101330801	Streblospio benedicti	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	4
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Mytiloida	Mytilidae	3401 0401 0101		Amygdalum sagittatum	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	25
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Cardiidae	3401 1102 0202	3401090601	Laevicardium mortoni	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	10
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	10
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0299	3401020203	Semele (LPIL)	8
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	4
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0199	3401110199	Tellina (LPIL)	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	679
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0502	3401150502	Chione cancellata	3
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	23
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Acteonidae	3402 0401 0301	3402070301	Rictaxis punctostriatus	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Hamineidae	3402 0403 0201	3402780202	Atys sandersoni	6
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	3
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Cerithiidae	3402 0607 0899	3402440899	Cerithium (LPIL)	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	3
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Turridae	3402 0715 2304		Crassispira fuscescens	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0217		Odostomia impressa	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampithoidae	4501 0105 0101	3706250101	Cymadusa compta	12
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Aoridae	4501 0107 0101	3706121301	Grandidierella bonnieroid	3
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Gammaridae	4501 0117 0101		Gammarus mucronatus	3
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Cumacea	Diastylidae	4501 0202 0199	3707020199	Oxyurostylis (LPIL)	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Decapoda	Xanthidae	4501 0345 0099	3712070099	Xanthidae (LPIL)	1
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Cylindroleberidid	4502 0101 0902	3714070902	Parasterope pollex	3
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0123	3714090123	Eusarsiella childi	4
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	14
Stn. 5	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	255

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Maldanidae	3101 0303 0099	3101170099	Maldanidae (LPIL)	42
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0099	3101220099	Onuphidae (LPIL)	6
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0599	3101240599	Leitoscoloplos (LPIL)	3
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	3101 1212 0099	3101270099	Phyllodocidae (LPIL)	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Sabellida	Sabellidae	3101 1401 1901	3101351901	Fabricinuda trilobata	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	8
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Mactridae	3401 1115 0201	3401220201	Mulinia lateralis	2
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	4
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0299	3401020203	Semele (LPIL)	3
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	26
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	9
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Acteonidae	3402 0401 0301	3402070301	Rictaxis punctostriatus	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	3
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	4
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0299	3402150299	Odostomia (LPIL)	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0101	3706040101	Ampelisca abdita	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Isopoda	Anthuridae	4501 0402 0101	3705010101	Cyathura polita	1
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	2
Stn. 6	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	108
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Maldanidae	3101 0303 0099	3101170099	Maldanidae (LPIL)	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Goniadidae	3101 1206 0101	3101140101	Glycinde solitaria	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Magelonidae	3101 1506 0107	3101180107	Magelona pettiboneae	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	2
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	4
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	3
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	5
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	5
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	17
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Hamineidae	3402 0403 0201	3402780202	Atys sandersoni	4
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	2
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	4
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0101	3706040101	Ampelisca abdita	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampithoidae	4501 0105 0101	3706250101	Cymadusa compta	2
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Cumacea	Diastylidae	4501 0202 0113	3710040499	Oxyurostylis lecroyae	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Cylindroleberidid	4502 0101 0902	3714070902	Parasterope pollex	1
Stn. 7	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Maldanidae	3101 0303 0099	3101170099	Maldanidae (LPIL)	11
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Maldanidae	3101 0303 0202	3101170202	Axiothella mucosa	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0101	3101220101	Diopatra cuprea	4
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0710	3101220205	Kinbergonuphis simoni	34
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0503		Leitoscoloplos foliosus	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	6
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Hesionidae	3101 1207 0701	3101150701	Podarkeopsis levifuscina	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0403	3101200403	Nereis succinea	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	31
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 0702	3101340702	Syllis cornuta	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Sabellida	Sabellidae	3101 1401 0499	3101350499	Chone (LPIL)	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Sabellida	Sabellidae	3101 1401 1901	3101351901	Fabricinuda trilobata	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Magelonidae	3101 1506 0107	3101180107	Magelona pettiboneae	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0412	3101330412	Polydora cornuta	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Terebellida	Ampharetidae	3101 1701 0202	3101030202	Melinna maculata	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Mytiloida	Mytilidae	3401 0401 0101		Amygdalum sagittatum	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Mytiloida	Mytilidae	3401 0401 0199		Amygdalum (LPIL)	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0602		Neaeromya floridana	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0299	3401020203	Semele (LPIL)	4
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	6

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0199	3401110199	Tellina (LPIL)	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	22
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 1002	3401151002	Macrocallista maculata	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Caecidae	3402 0604 0102	3402090102	Caecum pulchellum	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Cerithiidae	3402 0607 0801		Cerithium muscarum	4
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Columbellidae	3402 0703 0302	3402040302	Mitrella lunata	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Marginellidae	3402 0706 0101	3402380101	Granulina ovuliformis	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Marginellidae	3402 0706 0207	3402380207	Marginella apicina	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0116		Turbonilla portoricana	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0143		Ampelisca cristata	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampithoidae	4501 0105 0101	3706250101	Cymadusa compta	2
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Isopoda	Idoteidae	4501 0420 0201	3705020201	Erichsonella attenuata	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Isopoda	Sphaeromatidae	4501 0434 0201	3705240201	Harrieta faxoni	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Mysidacea	Mysidae	4501 0601 0202		Taphromysis bowmani	1
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	3
Stn. 8	9/1/2005			Macrofauna	Petite Ponar	0.023	Echinodermata	Ophiuroidea	Ophiurida	Ophiactidae	5301 0102 0201		Hemipholis elongata	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Cnidaria	Anthozoa	Actiniaria		1302 0100 0099	102000099	Actiniaria (LPIL)	8
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Rhynchocoela				1700 0000 0099	700000099	Rhynchocoela (LPIL)	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0402	3101050402	Mediomastus ambiseta	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0499	3101050499	Mediomastus (LPIL)	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0710	3101220205	Kinbergonuphis simoni	31
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0101	3101240101	Scoloplos rubra	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Goniadidae	3101 1206 0101	3101140101	Glycinde solitaria	3
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 0702	3101340702	Syllis cornuta	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 1126	3101341126	Exogone rolani	3
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Sabellida	Sabellidae	3101 1401 0499	3101350499	Chone (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Chaetopteridae	3101 1503 0201	3101060201	Spiochaetopterus oculatu	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Cirratulidae	3101 1504 1101	3101071101	Monticellina dorsobranch	11
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Magelonidae	3101 1506 0199	3101180000	Magelona (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	8
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0501	3101331999	Prionospio cirrifera	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Terebellida	Pectinariidae	3101 1702 0101	3101490101	Pectinaria gouldii	5
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	10
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Mytiloida	Mytilidae	3401 0401 0199		Amygdalum (LPIL)	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	3
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0099	3401100099	Lucinidae (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0502	3401100502	Lucina nassula	11
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Mactridae	3401 1115 0201	3401220201	Mulinia lateralis	7
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	129
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0602		Neaeromya floridana	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0201	3401020301	Semele proficua	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0111	3401110215	Tellina sybaritica	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0199	3401110199	Tellina (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	6
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0502	3401150502	Chione cancellata	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Haminoeidae	3402 0403 0201	3402780202	Atys sandersoni	6
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	6
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Caecidae	3402 0604 0102	3402090102	Caecum pulchellum	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Cerithiidae	3402 0607 1201		Bittiolum varium	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Vitrinellidae	3402 0629 0399		Teinostoma (LPIL)	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Columbellidae	3402 0703 0302	3402040302	Mitrella lunata	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	6
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0199	3402060199	Nassarius (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0206	3402150206	Odostomia laevigata	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0143		Ampelisca cristata	2
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Cumacea	Bodotriidae	4501 0201 0107	3707010107	Cyclaspis varians	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Cumacea	Diastylidae	4501 0202 0113	3710040499	Oxyurostylis lecroyae	2

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Decapoda	Xanthidae	4501 0345 0099	3712070099	Xanthidae (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Mysidacea	Mysidae	4501 0601 0099	3709010099	Mysidae (LPIL)	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	1
Stn. 9	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	81
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0099	3101220099	Onuphidae (LPIL)	23
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0710	3101220205	Kinbergonuphis simoni	2
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 1126	3101341126	Exogone rolani	2
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Cirratulidae	3101 1504 0312	3101070312	Tharyx acutus	1
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	2
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Mactridae	3401 1115 0201	3401220201	Mulinia lateralis	1
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0602		Neaeromya floridana	1
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	2
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0201	3401020301	Semele proficua	2
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0502	3401150502	Chione cancellata	2
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Caecidae	3402 0604 0102	3402090102	Caecum pulchellum	1
Stn. 10	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0143		Ampelisca cristata	3
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Rhynchocoela				1700 0000 0099	700000099	Rhynchocoela (LPIL)	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0402	3101050402	Mediomastus ambiseta	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0710	3101220205	Kinbergonuphis simoni	8
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0504	3101240504	Leitoscoloplos robustus	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0311	3101250311	Cirrophorus lyra	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Goniadidae	3101 1206 0101	3101140101	Glycinde solitaria	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 1126	3101341126	Exogone rolani	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Sabellida	Sabellidae	3101 1401 0499	3101350499	Chone (LPIL)	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Poecilochaetidae	3101 1507 0101	3101400101	Poecilochaetus johnsoni	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0599	3101330599	Prionospio (LPIL)	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	17
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Mytiloida	Mytilidae	3401 0401 0199		Amygdalum (LPIL)	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Pholadomyoida	Lyonsiidae	3401 0702 0104	3401300103	Lyonsia hyalina	23
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Cardiidae	3401 1102 0202	3401090601	Laevicardium mortoni	3
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0502	3401100502	Lucina nassula	9
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0599	3401100599	Lucina (LPIL)	3
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Mactridae	3401 1115 0201	3401220201	Mulinia lateralis	9
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	15
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	31
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0201	3401020301	Semele proficua	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Semelidae	3401 1121 0299	3401020203	Semele (LPIL)	5
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0111	3401110215	Tellina sybaritica	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0199	3401110199	Tellina (LPIL)	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	17
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0502	3401150502	Chione cancellata	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	7
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Hamineidae	3402 0403 0201	3402780202	Atys sandersoni	10
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	5
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Caecidae	3402 0604 0102	3402090102	Caecum pulchellum	12
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Columbellidae	3402 0703 0302	3402040302	Mitrella lunata	6
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	4
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0206	3402150206	Odostomia laevigata	4
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neotaenioglossa	Batillariidae	3402 2101 0101		Batillaria minima	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0143		Ampelisca cristata	3
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0199	3706040199	Ampelisca (LPIL)	3
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ischyroceridae	4501 0128 0201		Cerapus benthophilus	9
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Liljeborgiidae	4501 0131 0101	3706070101	Listriella barnardi	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Cumacea	Diastylidae	4501 0202 0113	3710040499	Oxyurostylis lecroyae	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Isopoda	Idoteidae	4501 0420 0701	3705020701	Edotia triloba	2
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Mysidacea	Mysidae	4501 0601 0099	3709010099	Mysidae (LPIL)	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Mysidacea	Mysidae	4501 0601 1201		Americamysis almyra	5
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Tanaidacea	Leptochelidae	4501 0803 0401		Hargeria rapax	1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Cylindroleberidid	4502 0101 0902	3714070902	Parasterope pollex	16

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0123	3714090123	Eusarsiella childi	4
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	37
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	176
Stn. 11	9/1/2005			Macrofauna	Petite Ponar	0.023	Echinodermata	Ophiuroidea	Ophiurida	Ophiactidae	5301 0102 0201		Hemipholis elongata	5
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Onuphidae	3101 0606 0710	3101220205	Kinbergonuphis simoni	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0101	3101240101	Scoloplos rubra	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 0305	3101340305	Sphaerosyllis piriferopsis	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Syllidae	3101 1218 0702	3101340702	Syllis cornuta	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	3
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0599	3101330599	Prionospio (LPIL)	2
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0502	3401100502	Lucina nassula	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Mactridae	3401 1115 0201	3401220201	Mulinia lateralis	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	3
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0202	3401110202	Macoma tenta	1
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	9
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Haminoeidae	3402 0403 0201	3402780202	Atys sandersoni	14
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	2
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0206	3402150206	Odostomia laevigata	3
Stn. 12	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	24
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nereidae	3101 1210 0701	3101200701	Laeonereis culveri	1
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	29
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	3
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Haminoeidae	3402 0403 0201	3402780202	Atys sandersoni	1
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	1
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0143		Ampelisca cristata	42
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Cylindroleberidid	4502 0101 0902	3714070902	Parasterope pollex	1
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	1
Stn. 13	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	2
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Cnidaria	Anthozoa	Actiniaria		1302 0100 0099	102000099	Actiniaria (LPIL)	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0402	3101050402	Mediomastus ambiseta	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	5
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0105	3401110218	Tellina texana	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	7
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae	4501 0103 0143		Ampelisca cristata	1
Stn. 14	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	13
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Cnidaria	Anthozoa	Actiniaria		1302 0100 0099	102000099	Actiniaria (LPIL)	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Rhynchocoela				1700 0000 0099	700000099	Rhynchocoela (LPIL)	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Capitellida	Capitellidae	3101 0302 0402	3101050402	Mediomastus ambiseta	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Eunicida	Oenonidae	3101 0605 0102	3101460102	Drilonereis longa	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Paraonidae	3101 1002 0202	3101250202	Aricidea philbinae	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Goniadidae	3101 1206 0101	3101140101	Glycinde solitaria	2
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Cirratulidae	3101 1504 1101	3101071101	Monticellina dorsobranch	6
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	11
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	17
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0502	3401100502	Lucina nassula	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0199	3401110199	Tellina (LPIL)	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0801	3401150801	Anomalocardia auberiana	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Haminoeidae	3402 0403 0201	3402780202	Atys sandersoni	14
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	3
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Nassariidae	3402 0710 0103		Nassarius vibex	5
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	3
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Cylindroleberidid	4502 0101 0902	3714070902	Parasterope pollex	1
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Sarsiellidae	4502 0105 0124	3714090124	Eusarsiella zostericola	2
Stn. 15	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	3
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Orbiniida	Orbiniidae	3101 1001 0101	3101240101	Scoloplos rubra	1

Station ID	Sample Date	Latitude	Longitude	Sample Type	Sample Method	Sample Area	Phylum	Class	Order	Family	Taxon Number	Old Taxon Number	Taxon Name	Rep 1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Goniadidae	3101 1206 0101	3101140101	Glycinde solitaria	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Nephtyidae	3101 1209 0101	3101190201	Aglaophamus verrilli	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Phyllodocida	Sigalionidae	3101 1216 0204	3101320102	Sthenelais sp. A	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Chaetopteridae	3101 1503 0201	3101060201	Spiochaetopterus oculatu	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Cirratulidae	3101 1504 1101	3101071101	Monticellina dorsobranch	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Polychaeta	Spionida	Spionidae	3101 1508 0301	3101330301	Paraprionospio pinnata	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Annelida	Oligochaeta	Tubificida	Tubificidae	3103 0103 0099	3103030099	Tubificidae (LPIL)	3
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0502	3401100502	Lucina nassula	9
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Lucinidae	3401 1114 0599	3401100599	Lucina (LPIL)	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Mactridae	3401 1115 0201	3401220201	Mulinia lateralis	4
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Montacutidae	3401 1117 0401	3401650401	Mysella planulata	6
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Psammobiidae	3401 1120 0102		Tagelus plebeius	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Tellinidae	3401 1125 0202	3401110202	Macoma tenta	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Bivalvia	Veneroida	Veneridae	3401 1129 0402	3401150402	Gemma gemma	3
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Haminoeidae	3402 0403 0201	3402780202	Atys sandersoni	3
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	3402 0407 0102	3402770102	Acteocina canaliculata	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Mesogastropoda	Cerithiidae	3402 0607 0899	3402440899	Cerithium (LPIL)	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Columbellidae	3402 0703 0302	3402040302	Mitrella lunata	3
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Neogastropoda	Marginellidae	3402 0706 0207	3402380207	Marginella apicina	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Mollusca	Gastropoda	Pyramidelloida	Pyramidellidae	3402 0901 0116		Turbonilla portoricana	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Sipuncula			Golfingiidae	3500 0001 0201	2800010201	Phascolion strombi	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Ampithoidae	4501 0105 0101	3706250101	Cymadusa compta	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Bateidae	4501 0110 0101	3706030101	Batea catharinensis	10
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Amphipoda	Liljeborgiidae	4501 0131 0101	3706070101	Listriella barnardi	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Malacostraca	Isopoda	Anthuridae	4501 0402 2701	3705012701	Amakusanthura magnific	1
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Myodocopina	Cylindroleberidid	4502 0101 0902	3714070902	Parasterope pollex	2
Stn. 16	9/1/2005			Macrofauna	Petite Ponar	0.023	Arthropoda	Ostracoda	Podocopida	Cytherideidae	4502 0204 0101	3714010101	Haplocytheridea setipunc	8

TAXONOMIC SPECIES LIST

Client: ECE
Project: ECE Blind Pass
Location:

Project Date: 09/01/2005

Total Number of Taxa: 123

- ANNELIDA
  - CLASS OLIGOCHAETA
    - Order TUBIFICIDA
      - FAMILY TUBIFICIDAE
        - Tubificidae (LPIL)
  - CLASS POLYCHAETA
    - Order CAPITELLIDA
      - FAMILY CAPITELLIDAE
        - Capitella capitata
        - Mediomastus (LPIL)
        - Mediomastus ambiseta
      - FAMILY MALDANIDAE
        - Maldanidae (LPIL)
        - Axiothella mucosa
    - Order EUNICIDA
      - FAMILY OENONIDAE
        - Drilonereis longa
      - FAMILY ONUPHIDAE
        - Onuphidae (LPIL)
        - Diopatra cuprea
        - Kinbergonuphis simoni
    - Order ORBINIIDA
      - FAMILY ORBINIIDAE
        - Leitoscoloplos (LPIL)
        - Leitoscoloplos foliosus
        - Leitoscoloplos robustus
        - Scoloplos rubra
      - FAMILY PARAONIDAE
        - Aricidea philbinae
        - Cirrophorus lyra
    - Order PHYLLODOCIDA
      - FAMILY GONIADIDAE
        - Glycinde solitaria
      - FAMILY HESIONIDAE
        - Podarkeopsis levifuscina
      - FAMILY NEPHTYIDAE
        - Aglaophamus verrilli
      - FAMILY NEREIDAE
        - Laeonereis culveri
        - Nereis succinea

- FAMILY SYLLIDAE
  - Exogone rolani
  - Sphaerosyllis piriferopsis
  - Syllis cornuta
- Order SABELLIDA
  - FAMILY SABELLIDAE
    - Chone (LPIL)
    - Fabricinuda trilobata
- Order SPIONIDA
  - FAMILY CHAETOPTERIDAE
    - Spiochaetopterus oculatus
  - FAMILY CIRRATULIDAE
    - Monticellina dorsobranchialis
    - Tharyx acutus
  - FAMILY MAGELONIDAE
    - Magelona (LPIL)
    - Magelona pettiboneae
  - FAMILY POECILOCHAETIDAE
    - Poecilochaetus johnsoni
  - FAMILY SPIONIDAE
    - Paraprionospio pinnata
    - Polydora cornuta
    - Prionospio (LPIL)
    - Prionospio cirrifera
    - Streblospio benedicti
- Order TEREBELLIDA
  - FAMILY AMPHARETIDAE
    - Hobsonia florida
    - Melinna maculata
  - FAMILY PECTINARIIDAE
    - Pectinaria gouldii

ARTHROPODA
- CLASS MALACOSTRACA
  - Order AMPHIPODA
    - FAMILY AMPELISCIDAE
      - Ampelisca (LPIL)
      - Ampelisca abdita
      - Ampelisca cristata
    - FAMILY AMPITHOIDAE
      - Cymadusa compta
    - FAMILY AORIDAE
      - Aoridae (LPIL)
      - Grandidierella bonnieroides
    - FAMILY BATEIDAE
      - Batea catharinensis
    - FAMILY GAMMARIDAE
      - Gammarus mucronatus
    - FAMILY ISCHYROCERIDAE

FAMILY DIASTYLIDAE
Oxyurostylis (LPIL)
Oxyurostylis lecroyae
Order DECAPODA
FAMILY XANTHIDAE
Xanthidae (LPIL)
Order ISOPODA
FAMILY ANTHURIDAE
Amakusanthura magnifica
Cyathura polita
FAMILY IDOTEIDAE
Edotia triloba
Erichsonella attenuata
FAMILY SPHAEROMATIDAE
Harrieta faxoni
Order MYSIDACEA
FAMILY MYSIDAE
Mysidae (LPIL)
Americamysis almyra
Taphromysis bowmani
Order TANAIDACEA
FAMILY LEPTOCHELIDAE
Hargeria rapax
Leptochelia (LPIL)

CLASS OSTRACODA
Order MYODOCOPINA
FAMILY CYLINDROLEBERIDIDAE
Parasterope pollex
FAMILY SARSIELLIDAE
Eusarsiella childi
Eusarsiella zostericola
Order PODOCOPIDA
FAMILY CYTHERIDEIDAE
Haplocytheridea setipunctata

CNIDARIA
CLASS ANTHOZOA
Order ACTINIARIA
Actiniaria (LPIL)

ECHINODERMATA
CLASS OPHIUROIDEA
Order OPHIURIDA
FAMILY AMPHIURIDAE
Amphiuridae (LPIL)
FAMILY OPHIACTIDAE
Hemipholis elongata

Order MYTILOIDA
FAMILY MYTILIDAE
Mytilidae (LPIL)
Amygdalum (LPIL)
Amygdalum sagittatum
Order PHOLADOMYOIDA
FAMILY LYONSIIDAE
Lyonsia hyalina
Order VENEROIDA
FAMILY CARDIIDAE
Laevicardium mortoni
FAMILY LUCINIDAE
Lucinidae (LPIL)
Lucina (LPIL)
Lucina nassula
FAMILY MACTRIDAE
Mulinia lateralis
FAMILY MONTACUTIDAE
Mysella planulata
Neaeromya floridana
FAMILY PSAMMOBIIDAE
Psammobiidae (LPIL)
Tagelus (LPIL)
Tagelus plebeius
FAMILY SEMELIDAE
Semele (LPIL)
Semele proficua
FAMILY TELLINIDAE
Macoma tenta
Tellina (LPIL)
Tellina sybaritica
Tellina texana
FAMILY VENERIDAE
Anomalocardia auberiana
Chione cancellata
Gemma gemma
Macrocallista maculata

CLASS GASTROPODA
Gastropoda (LPIL)
Order CEPHALASPIDEA
FAMILY ACTEONIDAE
Rictaxis punctostriatus
FAMILY HAMINEIDAE
Atys sandersoni
FAMILY SCAPHANDRIDAE
Acteocina canaliculata
Order MESOGASTROPODA
FAMILY CAECIDAE

FAMILY RISSOIDAE
Rissoidae (LPIL)
FAMILY VITRINELLIDAE
Teinostoma (LPIL)
Order NEOGASTROPODA
FAMILY COLUMBELLIDAE
Mitrella lunata
FAMILY MARGINELLIDAE
Granulina ovuliformis
Marginella apicina
FAMILY MITRIDAE
Pusia gemmata
FAMILY NASSARIIDAE
Nassarius (LPIL)
Nassarius vibex
FAMILY TURRIDAE
Crassispira fuscescens
Order NEOTAENIOGLOSSA
FAMILY BATILLARIIDAE
Batillaria minima
Order PYRAMIDELLOIDA
FAMILY PYRAMIDELLIDAE
Odostomia (LPIL)
Odostomia impressa
Odostomia laevigata
Turbonilla portoricana

RHYNCHOCOELA
Rhynchocoela (LPIL)

SIPUNCULA
FAMILY GOLFINGIIDAE
Phascolion strombi

Attachment #33(a)

See Attachment #33 (Design Report)
Under Separate Cover

Attachment 33(b)

Sediment Composites

Table 33(b)-1 Preferred Alternative Overall Composite			Total Volume (ft^3)	Total Volume (yds^3)															
			3,109,970	115,184															
Sieve Size (Phi)	-4	-3.5	-3	-2.5	-2.25	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2	2.5	3	3.5	3.75	4
Sieve Size (mm)	15.875	11.125	7.925	5.664	4.75	4	2.794	2	1.41	1	0.706	0.5	0.353	0.25	0.18	0.124	0.09	0.074	0.064
Blind Pass Core Composite Preferred Alternative	98.77	98.31	97.70	95.84	93.95	91.52	88.23	84.66	79.47	73.82	67.36	59.81	52.11	40.64	24.63	12.21	4.23	3.14	2.71

Table 33(b)-2	Dredge Elevation (ft, NAVD)	Core Number			Sub Area Volume (ft^3)	Blind Pass Restoration Project - Sediment Composites														
Sub-Area 1	-10				1,151,716															
		CEC-1 Core Composite	0.00	0.00	0.98	7.39	12.77	20.44	29.60	37.89	48.74	59.13	69.36	79.34	87.03	92.56	96.70	98.83	99.44	99.56	99.67
		CEC-1 Composite % Passing	**100.00**	**100.00**	**99.02**	**92.61**	**87.23**	**79.56**	**70.40**	**62.11**	**51.26**	**40.87**	**30.64**	**20.66**	**12.97**	**7.44**	**3.30**	**1.17**	**0.56**	**0.44**	**0.33**
CEC-1																					
		CEC-22 Core Composite	0.00	1.59	2.51	5.03	7.53	10.77	15.59	20.81	29.28	38.23	47.33	56.58	65.21	75.30	90.22	97.50	98.86	99.02	99.18
		CEC-22 Composite % Passing	**100.00**	**98.41**	**97.49**	**94.97**	**92.47**	**89.23**	**84.41**	**79.19**	**70.72**	**61.77**	**52.67**	**43.42**	**34.79**	**24.70**	**9.78**	**2.50**	**1.14**	**0.98**	**0.82**
		Sieve Size (Phi)	**-4**	**-3.5**	**-3**	**-2.5**	**-2.25**	**-2**	**-1.5**	**-1**	**-0.5**	**0**	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**	**3.75**	**4**
CEC-22		**Sieve Size (mm)**	**15.875**	**11.125**	**7.925**	**5.664**	**4.75**	**4**	**2.794**	**2**	**1.41**	**1**	**0.706**	**0.5**	**0.353**	**0.25**	**0.18**	**0.124**	**0.09**	**0.074**	**0.064**
	37.0%	**Sub Area 1 Composite**	**100.00**	**99.20**	**98.25**	**93.79**	**89.85**	**84.40**	**77.40**	**70.65**	**60.99**	**51.32**	**41.65**	**32.04**	**23.88**	**16.07**	**8.54**	**1.83**	**0.85**	**0.71**	**0.57**

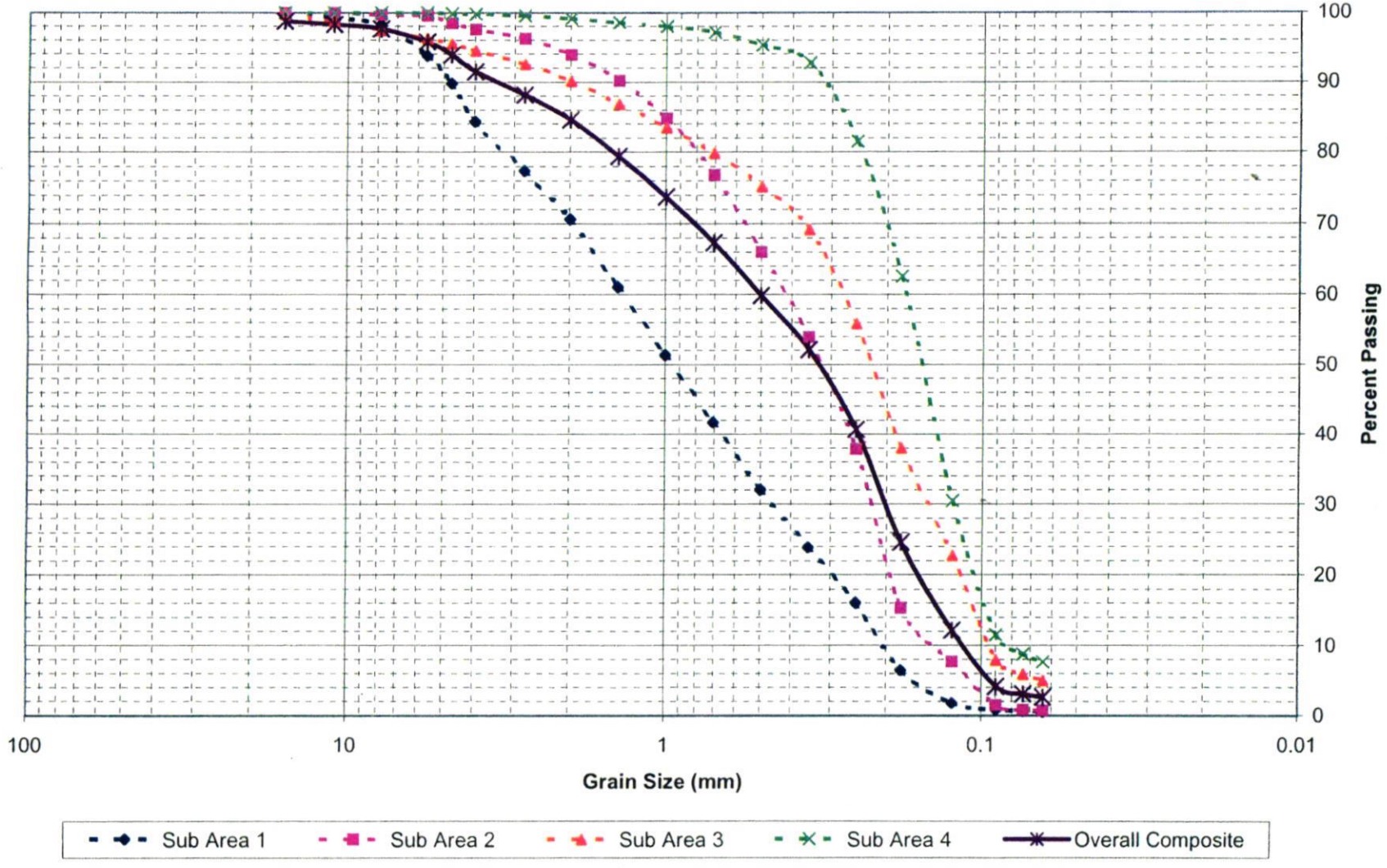
Table 33(b)-3	Dredge Elevation (ft, NAVD)	Core Number			Sub Area Volume (ft³)	Blind Pass Restoration Project - Sediment Composites														
Sub Area 2	-10				838,073															
		CEC-2 Core Composite	0.00	0.00	0.56	0.56	1.93	2.95	4.50	7.49	11.33	16.18	22.50	32.37	45.67	61.15	80.27	86.52	97.65	98.87	98.87
		CEC-2 Composite % Passing	**100.00**	**100.00**	**99.44**	**99.44**	**98.07**	**97.05**	**95.50**	**92.51**	**88.67**	**83.82**	**77.50**	**67.63**	**54.33**	**38.85**	**19.73**	**13.48**	**2.35**	**1.13**	**1.13**
CEC-2																					
		CEC-23 Core Composite	0.00	0.00	0.00	0.23	1.03	1.82	2.96	4.55	8.15	14.08	23.73	35.67	46.48	63.16	88.93	98.00	99.23	99.41	99.55
		CEC-23 Composite % Passing	**100.00**	**100.00**	**100.00**	**99.77**	**98.97**	**98.18**	**97.04**	**95.45**	**91.85**	**85.92**	**76.27**	**64.33**	**53.52**	**36.84**	**11.07**	**2.00**	**0.77**	**0.59**	**0.45**
		Sieve Size (Phi)	**-4**	**-3.5**	**-3**	**-2.5**	**-2.25**	**-2**	**-1.5**	**-1**	**-0.5**	**0**	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**	**3.75**	**4**
CEC-23		**Sieve Size (mm)**	**15.875**	**11.125**	**7.925**	**5.664**	**4.75**	**4**	**2.794**	**2**	**1.41**	**1**	**0.706**	**0.5**	**0.353**	**0.25**	**0.18**	**0.124**	**0.09**	**0.074**	**0.064**
	26.9%	**Sub Area 2 Composite**	**100.00**	**100.00**	**99.72**	**99.61**	**98.52**	**97.61**	**96.27**	**93.98**	**90.26**	**84.87**	**76.88**	**65.98**	**53.93**	**37.84**	**15.40**	**7.74**	**1.56**	**0.86**	**0.79**

Table 33(b)-4	Dredge Elevation (ft, NAVD)	Core Number	Sub Area Volume (ft^3)	Blind Pass Restoration Project - Sediment Composites																
Sub Area 3	-8		471,697																	
CEC-15		CEC-15 Core Composite	0.00	0.00	0.00	0.00	0.00	0.13	0.19	0.44	0.87	1.54	2.81	5.24	9.89	48.29	83.06	97.68	99.30	99.40	99.40
		CEC-15 Composite % Passing	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**99.87**	**99.81**	**99.56**	**99.13**	**98.46**	**97.19**	**94.76**	**90.11**	**51.71**	**16.94**	**2.32**	**0.70**	**0.60**	**0.60**
CEC-14		CEC-14 Core Composite	0.00	0.00	0.00	0.32	0.55	0.87	1.50	2.60	4.03	5.87	8.18	11.90	17.37	25.68	39.92	43.51	79.32	82.55	84.15
		CEC-14 Composite % Passing	**100.00**	**100.00**	**100.00**	**99.68**	**99.45**	**99.13**	**98.50**	**97.40**	**95.97**	**94.13**	**91.82**	**88.10**	**82.63**	**74.32**	**60.08**	**56.49**	**20.68**	**17.45**	**15.85**
CEC-4		CEC-4 Core Composite	0.00	0.00	0.00	0.43	0.54	0.88	1.45	2.06	2.82	3.70	4.78	6.68	10.17	19.81	48.17	79.80	95.77	97.23	98.04
		CEC-4 Composite % Passing	**100.00**	**100.00**	**100.00**	**99.57**	**99.46**	**99.12**	**98.55**	**97.94**	**97.18**	**96.30**	**95.22**	**93.32**	**89.83**	**80.19**	**51.83**	**20.20**	**4.23**	**2.77**	**1.96**
CEC-3		CEC-3 Core Composite	0.00	4.21	6.43	8.64	10.71	12.93	16.56	21.41	28.66	36.31	44.63	54.20	63.96	73.96	84.05	90.92	96.41	97.20	97.90
		CEC-3 Composite % Passing	**100.00**	**95.79**	**93.57**	**91.36**	**89.29**	**87.07**	**83.44**	**78.59**	**71.34**	**63.69**	**55.37**	**45.80**	**36.04**	**26.04**	**15.95**	**9.08**	**3.59**	**2.80**	**2.10**
CEC-5		CEC-5 Core Composite	0.00	0.00	0.00	0.20	0.41	0.71	1.07	1.82	2.92	4.54	7.00	10.20	15.08	22.82	35.11	58.19	87.02	93.00	95.46
		CEC-5 Composite % Passing	**100.00**	**100.00**	**100.00**	**99.80**	**99.59**	**99.29**	**98.93**	**98.18**	**97.08**	**95.46**	**93.00**	**89.80**	**84.92**	**77.18**	**64.89**	**41.81**	**12.98**	**7.00**	**4.54**
BP-5		BP-5 Core Composite	0	1.008958	3.77806939	7.117591	8.139601	9.728613	14.32832	19.38171	25.75779	31.63239	37.35478	43.6117	51.18746	60.49582	71.10258	84.52102	91.69995	92.71185	93.08402
		BP-5 Composite % Passing	**100.00**	**98.99**	**96.22**	**92.88**	**91.86**	**90.27**	**85.67**	**80.62**	**74.24**	**68.37**	**62.65**	**56.39**	**48.81**	**39.50**	**28.90**	**15.48**	**8.30**	**7.29**	**6.92**
BP-6		BP-6 Composite % Passing	1.437191	3.934404	7.21796245	8.99866	10.55693	12.82288	16.28084	20.75818	26.25956	31.09455	35.80559	40.98464	47.70905	58.01179	72.45121	85.66496	94.41356	95.975	96.51333
		BP-6 Composite % Passing	**98.56**	**96.07**	**92.78**	**91.00**	**89.44**	**87.18**	**83.72**	**79.24**	**73.74**	**68.91**	**64.19**	**59.02**	**52.29**	**41.99**	**27.55**	**14.34**	**5.59**	**4.02**	**3.49**
		Sieve Size (Phi)	**-4**	**-3.5**	**-3**	**-2.5**	**-2.25**	**-2**	**-1.5**	**-1**	**-0.5**	**0**	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**	**3.75**	**4**
		Sieve Size (mm)	**15.875**	**11.125**	**7.925**	**5.664**	**4.75**	**4**	**2.794**	**2**	**1.41**	**1**	**0.706**	**0.5**	**0.353**	**0.25**	**0.18**	**0.124**	**0.09**	**0.074**	**0.064**
	15.2%	**Sub Area 3 Composite**	**99.79**	**98.69**	**97.51**	**96.33**	**95.58**	**94.56**	**92.66**	**90.22**	**86.95**	**83.62**	**79.92**	**75.31**	**69.23**	**55.85**	**38.02**	**22.82**	**8.01**	**5.99**	**5.07**

Table 33(b)-5	Dredge Elevation (ft, NAVD)	Core Number			Sub Area Volume (ft^3)	Blind Pass Restoration Project - Sediment Composites														
Sub Area 4	-8				611,141															
		CEC-15 Core Composite	0.00	0.00	0.00	0.00	0.00	0.13	0.19	0.44	0.87	1.54	2.81	5.24	9.89	48.29	83.06	97.68	99.30	99.40	99.40
		CEC-15 Composite % Passing	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**99.87**	**99.81**	**99.56**	**99.13**	**98.46**	**97.19**	**94.76**	**90.11**	**51.71**	**16.94**	**2.32**	**0.70**	**0.60**	**0.60**
CEC-15																					
		CEC-16 Core Composite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.17	0.31	0.64	3.66	5.79	8.13	13.44	59.73	91.20	96.04	97.86
		CEC-16 Composite % Passing	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**99.89**	**99.83**	**99.69**	**99.36**	**96.34**	**94.21**	**91.87**	**86.56**	**40.27**	**8.80**	**3.96**	**2.14**
CEC-16																					
		BP-11 Composite	0	0	0	0.002482	0.066647	0.108596	0.167858	0.288991	0.632217	1.064117	1.964964	3.605931	6.618923	14.18149	38.55065	70.02076	82.03158	83.95821	84.79379
		BP-11 Composite % Passing	**100.00**	**100.00**	**100.00**	**100.00**	**99.93**	**99.89**	**99.83**	**99.71**	**99.37**	**98.94**	**98.04**	**96.39**	**93.38**	**85.82**	**61.45**	**29.98**	**17.97**	**16.04**	**15.21**
BP-11																					
		BP-7 Composite	0	0	0	0.015121	0.035158	0.052377	0.083846	0.235211	0.415662	0.713775	1.197287	2.018459	3.484489	8.197937	26.67328	62.92318	85.70528	89.28208	90.70677
		BP-7 Composite % Passing	**100.00**	**100.00**	**100.00**	**99.98**	**99.96**	**99.95**	**99.92**	**99.76**	**99.58**	**99.29**	**98.80**	**97.98**	**96.52**	**91.80**	**73.33**	**37.08**	**14.29**	**10.72**	**9.29**
BP-7																					
		BP-8A Composite	0	0	0	0	0.415022	0.638496	1.63459	3.035268	4.907593	6.269324	7.465006	8.721732	10.31639	13.54066	25.60948	57.48382	83.74476	87.11115	88.74797
		BP-8A Composite % Passing	**100.00**	**100.00**	**100.00**	**100.00**	**99.58**	**99.36**	**98.37**	**96.96**	**95.09**	**93.73**	**92.53**	**91.28**	**89.68**	**86.46**	**74.39**	**42.52**	**16.26**	**12.89**	**11.25**
		Sieve Size (Phi)	**-4**	**-3.5**	**-3**	**-2.5**	**-2.25**	**-2**	**-1.5**	**-1**	**-0.5**	**0**	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**	**3.75**	**4**
BP-8A		**Sieve Size (mm)**	**15.875**	**11.125**	**7.925**	**5.664**	**4.75**	**4**	**2.794**	**2**	**1.41**	**1**	**0.706**	**0.5**	**0.353**	**0.25**	**0.18**	**0.124**	**0.09**	**0.074**	**0.064**
	19.7%	**Sub Area 4 Composite**	**100.00**	**100.00**	**100.00**	**100.00**	**99.90**	**99.81**	**99.58**	**99.18**	**98.60**	**98.02**	**97.18**	**95.35**	**92.78**	**81.53**	**62.53**	**30.43**	**11.60**	**8.84**	**7.70**

5/1/20064:09 PM

Figure 33 (b)-1 Prefered Alternative Sub Area Composite
Grain Size Distribution Curves



H:\Projects\Blind Pass Restoration\Task 2 Field Investigations and Project Design\Task 2.6 Supplemental Core Borings\BP Composites Prefered Alternative 5_01_06.xls
Chart Preferred Alt

Attachment #33(d)

See Attachment #29

DRAFT

CONSOLIDATED JOINT COASTAL PERMIT AND INTENT TO GRANT SOVEREIGN SUBMERGED LANDS AUTHORIZATION

PERMITTEE/AUTHORIZED ENTITY:

Lee County Board of County Commissioners
P.O. Box 398
Ft. Myers, FL
33902-0398

PERMIT INFORMATION:
Permit/Authorization Number: 0265943-001-JC

Issuance Date: XXX

Expiration Date of Construction Phase: XXX

Project Name: Blind Pass Maintenance Dredging Project

County: Lee

This permit is issued under the authority of Chapter 161 and Part IV of Chapter 373, Florida Statutes (F.S.), and Title 62, Florida Administrative Code (F.A.C.). Pursuant to Operating Agreements executed between the Department of Environmental Protection (Department) and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing and taking final agency action on this activity.

ACTIVITY DESCRIPTION:

The project is to conduct maintenance dredging of the Blind Pass Channel and the connection to Roosevelt Channel. The channel will extend from the -10' NAVD contour in the Gulf of Mexico into the interior waters of the Pine Island Sound. The channel will have a maximum width of 330 feet in the Gulf and will narrow to 160 feet as it enters the Pass and continues into Pine Island Sound. In the initial maintenance dredging event, approximately 127,286 cubic yards of material will be removed from the Pass and interior system. Beach compatible material will be placed on downdrift beaches, between R-112 to R-114, suitable material will be placed in the nearshore between R-112 and R-114, and non-beach compatible material will be temporarily dewatered at a beach containment site, and then transported to an upland disposal site. Maintenance dredging of Blind Pass is expected to occur on a 5- year periodic schedule. Direct impacts from the initial dredging include 0.72 acres of seagrass, 0.157 acres of mangrove, and a 1.3 acre loss of sandy beach. As mitigation, dune areas on Captiva Island will be restored, mangroves will be planted in Clam Bayou, and a No Motor Zone will be created near Wulfert Keys to promote the recovery of seagrasses damaged by prop-scars.

The applicant has also requested a variance (File No. 0265943-002-EV) from Rule 62-4.244(5)(c), F.A.C., to temporarily establish an expanded mixing zone of 1500 meters downcurrent from the dredge site on the beach side of the bridge, and from the point of sand discharge onto the beach and nearshore disposal area.

ACTIVITY LOCATION:

The dredge site is located in the Blind Pass Channel, between Sanibel and Captiva Islands, and the disposal site is located on Sanibel Island between R-112 and R-114, in Lee County, Section 2, 11, 13, and 14, Township 46 South, Range 21 East, Gulf of Mexico, Class II (Pine Island Sound Aquatic Preserve) and III (Gulf of Mexico) Waters, Shellfish Harvesting Area of Pine Island Sound, Pine Island Sound Aquatic Preserve, Outstanding Florida Waters.

This activity also requires a proprietary authorization, as the activity is located on sovereign submerged lands owned by the Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, and Sections 253.002 and 253.77, F.S. The activity is not exempt from the need to obtain a proprietary authorization. The Department has the responsibility to review and take final action on this request for proprietary authorization in accordance with Section 18-21.0051, F.A.C., and the Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C. In addition to the above, this proprietary authorization has been reviewed in accordance with Chapter 253 and Chapter 258, F.S., Chapter 18-20, Chapter 18-21 and Section 62-343.075, F.A.C., and the policies of the Board of Trustees.

As staff to the Board of Trustees, the Department has reviewed the activity described above, and has determined that the dredging and beach and nearshore placement activities qualify for a Letter of Consent to use sovereign, submerged lands, as long as the work performed is located within the boundaries as described herein and is consistent with the terms and conditions herein. Therefore, consent is hereby granted, pursuant to Chapter 253.77, F.S., to perform the activity on the specified sovereign submerged lands. The Department has also determined that the No Motor Zone requires a lease for the use and management of those lands, pursuant to Chapter 253.77, F.S. The Department intends to issue a lease (BOT # 360343535), subject to the conditions in this permit.

The final documents required to execute the lease have been sent to the Division of State Lands. The Department intends to issue the lease, upon satisfactory execution of those documents. **You may not establish the No Motor Zone, install the associated signs or begin to accrue credit for the seagrass mitigation on state-owned, sovereign submerged lands until the lease has been executed to the satisfaction of the Department.**

This permit constitutes a finding of consistency with Florida's Coastal Management Program, as required by Section 307 of the Coastal Zone Management Act. This permit also constitutes certification of compliance with state water quality standards pursuant to Section 401 of the Clean Water Act, 33 U.S.C. 1341.

Authorization from the Department does not relieve you from the responsibility of obtaining other permits (Federal, State, or local) that may be required for the project. Your proposed activity as outlined on your application and attached drawings **does not qualify** for Federal authorization pursuant to State Programmatic General Permit IV (SGPG IV), and a **separate** permit or authorization will be required from the U.S. Army Corps of Engineers (USACE). A copy of this authorization has been sent to the USACE for review. The USACE will issue their authorization directly to you, or contact you if additional information is needed. If you have not heard from the USACE within 30 days from the date that your application was received by the Department, contact the nearest USACE regulatory office for

status and further information. Failure to obtain USACE authorization prior to construction could subject you to federal enforcement action by that agency.

The above named permittee is hereby authorized to construct the work shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof. **This permit and authorization to use sovereign submerged lands is subject to the limits, conditions, and locations of work shown in the attached drawings, and is also subject to the General Conditions and Specific Conditions, which are a binding part of this permit and authorization.** You are advised to read and understand these drawings and conditions prior to commencing the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read and understand these drawings and conditions prior to commencing the authorized activities.

GENERAL CONDITIONS:

1. All activities authorized by this permit shall be implemented as set forth in the plans and specifications approved as a part of this permit, and all conditions and requirements of this permit. The permittee shall notify the Department in writing of any anticipated deviation from the permit prior to implementation so that the Department can determine whether a modification of the permit is required pursuant to section 62B-49.008, Florida Administrative Code.

2. If, for any reason, the permittee does not comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Bureau of Beaches and Coastal Systems and the appropriate District office of the Department with a written report containing the following information: a description of and cause of noncompliance; and the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

3. This permit does not eliminate the necessity to obtain any other applicable licenses or permits that may be required by federal, state, local, special district laws and regulations. This permit is not a waiver or approval of any other Department permit or authorization that may be required for other aspects of the total project that are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of sovereignty land of Florida seaward of the mean high-water line, or, if established, the erosion control line, unless herein provided and the necessary title, lease, easement, or other form of consent authorizing the proposed use has been obtained from the State. The permittee is responsible for obtaining any necessary authorizations from the Board of Trustees of the Internal Improvement Trust Fund prior to commencing activity on sovereign lands or other state-owned lands.

5. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered specifically approved unless a specific condition of this permit or a formal determination under section 373.421(2), F.S., provides otherwise.

6. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee. The issuance of this permit does not convey any vested rights or any exclusive privileges.

7. This permit or a copy thereof, complete with all conditions, attachments, plans and specifications, modifications, and time extensions shall be kept at the work site of the permitted activity. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

8. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel with proper identification and at reasonable times, access to the premises where the permitted activity is located or conducted for the purpose of ascertaining compliance with the terms of the permit and with the rules of the Department and to have access to an copy any records that must be kept under conditions of the permit; to inspect the facility, equipment, practices, or operations regulated or required under this permit; and to sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules. Reasonable time may depend on the nature of the concern being investigated.

9. At least forty-eight (48) hours prior to commencement of activity authorized by this permit, the permittee shall submit to the Bureau of Beaches and Coastal Systems (JCP Compliance Officer) and the appropriate District office of the Department a written notice of commencement of construction indicating the actual start date and the expected completion date and an affirmative statement that the permittee and the contractor, if one is to be used, have read the general and specific conditions of the permit and understand them.

10. If historic or archaeological artifacts, such as, but not limited to, Indian canoes, arrow heads, pottery or physical remains, are discovered at any time on the project site, the permittee shall immediately stop all activities in the immediate area that disturb the soil in the immediate locale and notify the State Historic Preservation Officer and the Bureau of Beaches and Coastal Systems (JCP Compliance Officer). In the event that unmarked human remains are encountered during permitted activities, all work shall stop in the immediate area and the proper authorities notified in accordance with Section 872.02, F.S.

11. Within 30 days after completion of construction or completion of a subsequent maintenance event authorized by this permit, the permittee shall submit to the Bureau of Beaches and Coastal Systems (JCP Compliance Officer) and the appropriate District office of the Department a written statement of completion and certification by a registered professional engineer. This certification shall state that all locations and elevations specified by the permit have been verified; the activities authorized by the permit have been performed in compliance with the plans and specifications approved as a part of the permit, and all conditions of the permit; or shall describe any deviations from the plans and specifications, and all conditions of the permit. When the completed activity differs substantially from the permitted plans, any substantial deviations shall be noted and explained on two paper copies and one electronic copy of as-built drawings submitted to the Bureau of Beaches and Coastal Systems (JCP Compliance Officer)

SPECIFIC CONDITIONS:

1. The terms, conditions, and provisions of the required lease shall be met and shall also be subject to the conditions of this permit. Establishment of the No Motor Zone in Wulfert Flats and the installation of signage shall not commence on sovereign submerged lands, title to which is held by the Board of Trustees of the Internal Improvement Trust Fund, until all lease documents have been executed to the satisfaction of the Department and verification has been provided to the JCP Compliance Officer. No mitigation or public interest credit will be available for the No Motor Zone, until this requirement has been satisfied.

2. No work shall be conducted under this permit until and unless the Department issues a Final Order of Variance (File No. 0265943-002-EV) from Rule 62-4.244(5)(c), F.A.C. to establish an expanded mixing zone for the project.

3. If prehistoric or historic artifacts, such as pottery or ceramics, stone tools, wooden or metal implements, vessel remnants, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement or maritime culture are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at (850) 245-6333 or (800) 847-7278, as well as the Bureau of Beaches and Coastal Systems. Project activities shall not resume without verbal and / or written authorization from the Division of Historical Resources. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.

4. All reports or notices relating to this permit shall be sent to the DEP, Bureau of Beaches and Coastal Systems, JCP Compliance Officer, 3900 Commonwealth Boulevard, Mail Station 300, Tallahassee, Florida 32399-3000 (e-mail address: JCP Compliance@dep.state.fl.us) and the DEP South District Office, 2295 Victoria Avenue, Suite 364, Fort Myers, FL 33901-2896.

5. No work shall be conducted under this permit until the permittee has received a written notice to proceed from the Department. At least 30 days prior to the requested date of issuance of the notice to proceed (NTP), the permittee shall submit the following for review and approval by the Department:

   a. Two hard copies and an electronic copy of detailed ***final construction plans and specifications*** for all authorized activities, including a vessel operations plan. These documents shall be signed and sealed by the design engineer who must be registered in the State of Florida, and shall bear the certifications specified in Rule 62B-41.007(4), F.A.C. The plans and specifications shall include a description of the dredging and beach construction methods to be utilized and drawings and surveys that show all biological resources and work spaces (e.g., anchoring area, pipeline corridors, staging areas, boat access corridors, etc.) to be used for this project.

   b. ***Turbidity monitoring qualifications***. Construction at the project site shall be monitored closely by an experienced, independent third party to assure that turbidity levels do not exceed the

compliance standards established in this permit. Also, an individual familiar with beach construction techniques and turbidity monitoring shall be present at all times when fill material is discharged on the beach. This individual shall have authority to alter construction techniques or shut down the dredging or beach construction operations if turbidity levels exceed the compliance standards established in this permit. The names and qualifications of those individuals performing these functions along with 24-hour contact information shall be submitted for approval.

c. ***Updated maps for the approved Biological Monitoring Plan.*** The permittee shall monitor the progress and success of the mitigation activities and shall also monitor resources adjacent to the authorized impact areas for potential secondary impacts according to the approved Biological Monitoring Plan (approved January 2008). Updated maps of sampling areas, and transects on figures 7 and 10c shall be provided to the Department prior to issuance of the NTP. General bathymetry (of scarred areas) shall be noted on seagrass maps after conducting the preconstruction survey.

d. A revised detailed ***Physical Monitoring Plan***, as described in Specific Condition No. 45 (Physical Monitoring section), indicating the performance of the beach fill project, identifying erosion and accretion patterns within the monitored area, and **including inlet hydraulics data**. In addition, the report shall include a comparative review of project performance to performance expectations and identification of adverse impacts attributable to the project.

6. At least 7 days prior to commencement of construction activities authorized by this permit, the permittee shall conduct a pre-construction conference to review the conditions and monitoring requirements of this permit with permittee's contractors, the engineer of record, and Department staff representatives. The permittee shall provide written notification, at least 14 days in advance of the meeting, to the following offices advising of the date, time, location, and teleconference number of the pre-construction conference:

DEP Bureau of Beaches & Coastal Systems
JCP Compliance Officer
Mail Station 300
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000
phone: (850) 414-7716
fax: (850) 414-7725
e-mail: JCP Compliance@dep.state.fl.us

DEP South District Office
Submerged Lands & Environmental Resources
2295 Victoria Avenue
Suite 364
Fort Myers, FL 33901-2896
Phone: (239) 332-6975

Imperiled Species Management Section

Florida Fish & Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600
phone: (850) 922-4330
fax: (850) 921-4369

Charlotte Harbor Aquatic Preserve
12301 Burnt Store Road
Punta Gorda, Florida 33955
Phone: 941-575-5861
Fax: 941-575-5863

J.N. 'Ding' Darling National Wildlife Refuge
1 Wildlife Drive
Sanibel, FL 33957
Phone: (239) 472-1100 x225

7. Excavation activities shall be accomplished by a hydraulic dredge, a hydraulic suction head pump, or a hydraulic agitator and pump apparatus. During all dredging operations, electronic positioning equipment shall continuously monitor the vertical and horizontal location of the cutterhead or sediment intake location. Measurements shall be taken with a maximum lag time of three (3) minutes between readings. The horizontal accuracy shall be a minimum of sub-meter and the vertical shall be +/-0.5 feet, with continuous applicable tidal corrections measured at the project site. Any deviations from permit requirements shall be reported to DEP at the time of occurrence and shall include written explanations describing the violation as well as corrective actions taken.

8. During dredging activities, within a given subarea of the channel, the material designated for beach and nearshore placement shall be dredged prior to dredging the unsuitable clay material. Although dredging shall first commence in the interior waters landward of the bridge, work will be allowed to begin in multiple subareas and alternate between subareas. However, once removal of unsuitable clay material has begun within a specified subarea, no additional material from that specified subarea will be allowed for beach or nearshore placement.

9. Material designated for the beach and nearshore will be placed in the respective areas using a pipeline placed within a 12-foot corridor located as far landward as possible on the sandy beach without impacting any vegetation. The pipeline corridor established within the interior of Blind Pass will be located within the dredge footprint, and the corridor established outside of the dredge footprint shall be free of any seagrasses, oyster beds, and mangrove habitat. If necessary, pontoons or other floating devices shall be utilized to elevate the pipeline above the resources. No equipment will be allowed to traverse on or over these resources.

10. The permittee shall construct and maintain a shore-parallel sand dike at the beach placement area at all times during hydraulic discharge on the beach to meet turbidity standards prescribed by this permit (Specific Condition 43). In addition, within the Pine Island Sound Aquatic Preserve, the permittee shall affix turbidity curtains to prevent any turbidity plume from propagating outside of the work area. The

curtains shall be maintained at all times while operating in the Aquatic Preserve. While pumping onto the beach, Blind Pass shall be kept closed by use of a sheet pile wall until all dredging activities are completed. The wall shall separate the Gulf of Mexico from the Aquatic Preserve. If a turbidity plume from the dredging operations is observed seeping thru the wall, all operations shall cease until corrective actions have been taken and turbidity has returned to acceptable levels.

11. A sediment QA/QC plan was submitted for this project and was approved on 14 January 2008. The sediment QA/QC plan is based on the risk associated with this project. Due to the silty and clayey nature of the sediments in the base of the dredge cut and the apparent compaction of the sediment in the cores, the dredge elevations were designed to reduce the potential risk of placing silty or clayey material on the beach and/or in the nearshore. The sediment QA/QC plan also includes a Handling Plan which addresses the manner of dredging and handling of the material before it is placed on the beach or in the approved upland disposal site to further reduce the risk associated with the project and provide the Department with reasonable assurance that the unsuitable material will be handled in such a manner that no unsuitable material will be placed on the beach or in the nearshore. The remainder of the sediment QA/QC plan includes heightened observations and sampling by on-site personnel in order to minimize any placement of unsuitable material that may occur on the beach or in the nearshore. The sediment QA/QC plan and Handling Plan shall be strictly adhered to and discussed as a matter of importance at the pre-construction meeting. Should the County determine that variation from the plan is necessary, the Department shall be consulted.

12. A steel sheet pile containment cell shall be constructed and maintained for the purpose of dewatering unsuitable material. The containment cell shall be located on the beach area seaward of the Blind Pass bridge. The Handling Plan within the Sediment QA/QC Plan specifies the requirements for cell construction as well as the method for removing dewatered material from this cell and disposing of the material into the upland facility at the J.N. Ding Darling National Wildlife Refuge. Continual observation shall occur during the dewatering process to monitor if fines are resuspended in the water column. If greater than trace amounts are resuspended in the water column during discharge of supernatant, discharge operations shall cease, and allow the clay to settle out of the water column. Material shall be dry enough to prevent leakage from the trucks during transportation to the approved upland site. A minimum freeboard allowance of 2 feet shall be required on the sheet pile walls of the containment cell. The following surveys are required before and after filling the containment cell:

a. After the containment area has been constructed, an Initial Pre-Fill Survey of the containment area shall be conducted along transects at no more than 25 foot spacing. The survey shall be completed prior to excavating any portion of the clay material from the channel subareas.

b. After the containment area has been dewatered and prior to excavating the material for transport to the upland disposal site, the containment area shall be re-surveyed as a Post-Fill Survey. The survey shall be on the same transects as the Pre-Fill Survey.

c. If material is excavated for transport to the upland disposal site, the containment area shall be surveyed again, along the same transects, prior to placement of any additional unsuitable material. This survey shall be another Pre-fill survey.

13. Upon completion of the removal of all unsuitable material from the containment cell, the steel sheet pile, weir structure and dewatering pipe shall be removed, and the containment cell area shall be graded and leveled to restore the beach to pre-construction condition. In addition, all vegetation outside of Subarea 1 that has been damaged or removed for containment cell construction shall be restored. The impacts to vegetation at the containment cell area and access road, which represent approximately 1.96 acres, shall be restored by the permittee (with assistance from the City of Sanibel) , to the satisfaction of the City. The staging area to be used for the storage of equipment, vehicles, and supplies is a 0.26 acre public parking lot located north of the containment cell. Although no impacts to vegetation are expected, the permittee shall restore any impacts that may occur to pre-construction condition or better, as determined by the City of Sanibel. Similarly, upon completion, the upland disposal site at the J.N. Ding Darling National Wildlife Refuge and the access road for that site shall be graded, so that mounds, depressions, and ruts are removed.

14. Activities associated with the placement of material in the nearshore, and with the containment cell dewatering, shall only take place during daylight hours. All other components of the project may take place during both daylight and night-time hours.

15. Implementation of the No Motor Zone shall occur, and the lease for that activity shall be executed, prior to actual opening of Blind Pass. While dredging within the Pass may occur, the final cuts to open the Pass shall not occur prior to the No Motor Zone being posted and enforced.

16. This permit authorizes maintenance dredging of Blind Pass over a 5 year cycle. This primarily entails the initial clearing of shoals from the channel, some of which have temporarily closed the Pass. In the event another dredging event is needed during this period to maintain the channel, the Department would require the following items to issue the subsequent Notice to Proceed:

a. A new set of signed and sealed construction plans and specifications, including a modified dredge plan and a modified placement plan for the new event;
b. Updated physical monitoring plan;
c. Samples of shoaled material to be dredged; and
d. Updated turbidity monitoring qualifications, if any changes have been made.

17. **Mitigation:** The project will reopen Blind Pass through an area that is presently sandy beach, and will dredge through Blind Pass, into the Pine Island Sound Aquatic Preserve. The footprint of the channel contains 1.3 acres of sandy beach, 0.157 acres of mangroves and 0.72 acres of shoal grass (*Halodule wrightii*), all of which will be directly impacted by the dredging. In order to offset the impacts of the project, the permittee shall mitigate for the sandy beach, the mangroves and the seagrasses. An initial report on the mitigation implementation is required to be submitted to DEP within 90 days of completion of the initial Blind Pass Maintenance Dredging Event. The report shall include details on the implementation dates, follow-up activities, and success criteria as described in Mitigation and Monitoring Plans. The success criteria, monitoring requirements, and reporting criteria for the mitigation sites, as well as the monitoring and reporting criteria for the secondary impacts, are summarized under each portion in the Biological Monitoring section of the permit (Specific Condition 44). Mitigation requirements for the impact areas are described in the Department-approved Mitigation Plan and are summarized below.

a. Turtle Nesting Beach and Dune Vegetation. In order to mitigate for the loss of the turtle nesting beach and dune vegetation, the permittee shall enhance dunes along Captiva Drive as well as restore the dune at the northwest terminus of Captiva Drive.

1) The permittee shall remove the existing Australian pines from approximately 11.7 acres of dunes along 4900 feet of Captiva Drive, located about 1.5 miles north of Blind Pass. The permittee shall comply with the following conditions in establishing the mitigation along Captiva Drive:

i) Existing Australian pines shall be removed or cut down, and stumps shall be treated with appropriate herbicides.

ii) This work must be completed within 30 days of completion of the initial dredging event at Blind Pass. However, if FWC determines that it might present a risk to nesting sea turtles, the dune enhancement work may be delayed. In that case, this dune enhancement work shall commence within 30 days of hatching of the last nest in the area, and shall be completed within 30 days of initiation.

2) The permittee shall restore the dune at the northwest terminus of Captiva Drive, in order to prevent unauthorized vehicles from accessing and driving on the beach. The area is approximately 150 feet long, located about 3 miles north of Blind Pass, and is adjacent to a public access parking lot. The only existing vegetation is mature Australian pines. The permittee shall comply with the following conditions in establishing the mitigation for the northwest terminus of Captiva Drive:

i) The permittee shall remove the Australian pines, regrade the area and plant native dune vegetation sufficient to buffer the beach from the parking lot and associated vehicular lights. Plants shall include a row of sea grapes along the parking lot border, and a combination of beach elder, sea oats and panic grass to fill a planting area approximately 35' in width. The permittee shall prevent access to the beach at this location by unauthorized vehicles, and shall accomplish this by installing and maintaining a locked barricade. The vehicle barrier shall be installed prior to the beginning of the first sea turtle nesting season before project construction, and shall be maintained as needed for as long as the potential for vehicular access exists at this location.

ii) Most of the required dune restoration work has been completed prior to issuance of the final permit. After the Department accepted this part of the Blind Pass Mitigation Plan, early implementation was authorized through field permit Number -8023092, which was issued on 3-14-08, and expires 5-01-08. Planting of the smaller plants along the dune may occur during turtle nesting seasons, under the following conditions:

I. Two weeks prior to dune planting activities, the permittee shall notify DEP in writing. Planting activities are authorized to occur for no more than 7 days unless otherwise authorized in writing by DEP.

II. No planting activity may occur prior to a daily turtle nesting survey. All turtle protection measures defined in this permit shall apply.

III. Any vegetation planting or placement of irrigation materials shall be installed by hand labor/tools.

IV. Irrigation (if proposed) shall be entrenched 1 to 3 inches below grade

so as not to pose a barrier to hatchlings and to allow for easy removal. Irrigation piping shall avoid all marked nests by a minimum of ten (10) feet. The irrigation system shall be designed and maintained so that watering of the unplanted sandy beach does not occur. In the event a marine turtle nest is deposited within the newly established dune planting area, the permittee shall modify the irrigation system so that watering does not occur within 10 feet of the nest. Daily inspection of the irrigation system shall be accomplished by the permittee to ensure compliance with this condition.

V. In the event a nest is disturbed or uncovered during planting activity, the permittee shall cease all work and immediately contact the person(s) responsible for sea turtle conservation measures within the project area. If a nest(s) cannot be safely avoided during construction, all activity within the affected project area shall be delayed until complete hatching and emergence of the nest.

b. Mangrove Mitigation. The project will result in the loss of 0.157 acres of mangroves. To offset this loss, the Permittee shall plant 0.245 acres of mangroves in the Clam Bayou area. The permittee shall comply with the following conditions in establishing the mangrove mitigation site:

1) Red mangroves shall be planted in areas that currently have appropriate bathymetry, soils and hydroperiods to maintain a healthy red mangrove community. Primary planting areas have been identified and chosen based on the historic red mangrove presence and existing shoreline conditions favorable for access and planting. A secondary planting area has been selected and will only be used if problems are discovered in the primary areas at the time of mangrove planting. Planting shall occur during the mangrove growing season closest to the completion of the initial Blind Pass dredging event. At least 30 days prior to planting, the Permittee shall submit a Mangrove Planting Plan to the Department for review and approval. The planting plan shall indicate the name of the supply nursery, quantities, spacing, and minimum sizes (including tree height). The

planting plan shall include a map (with topographic contour lines, plus the MHW line and MLW line that are expected after the Blind Pass Channel is dredged) showing mangrove seedlings that have naturally recruited and successfully established within each of the mitigation areas prior to planting unit installation. Cross-section views, which show the number of red mangrove seedlings and elevations to be planted within each area, shall also be submitted for each of the planting areas.

2) The mangrove plantings shall not begin until the initial Blind Pass dredging is completed and the new MHW and MLW lines in Clam Bayou have been verified. This planting shall be completed within 60 days of completion of the initial Blind Pass dredging event. The 90 day post-construction report shall include locations, size and number of seedlings installed.

c. ***Seagrass Mitigation.*** Approximately 0.72 acres of patchy to sparse beds of shoal grass (*Halodule wrightii*) will be directly impacted by the initial dredge event. As mitigation, the permittee shall establish and maintain a "no motor zone" to promote the recovery of propeller scars in the seagrass beds. The recovery of 4.8 acres of seagrass scars shall be required to offset the seagrass impacts. To achieve this level of mitigation, the permittee will work with the J. N. Ding Darling National Wildlife Refuge (NWR) to establish a 474 acre seagrass protection zone near Wulfert Keys where the operation of combustion engines will not be allowed ("no motor zone"). This area consists of dense seagrass beds that are currently severely damaged with propeller scars. This area will be managed by the NWR, with the assistance of Lee County, and will be referred to as the No Motor Zone. The permittee shall comply with the following conditions in establishing the mitigation for the seagrass impacts:

1) The No Motor Zone is state owned sovereign submerged land. Management by NWR will be subject to a proprietary authorization in the form of a lease from the State of Florida to Lee County, which is being requested as part of this permitting action. The conditions of the lease, as well as a Management Plan submitted to the NWR, will outline the management and enforcement details of the No Motor Zone. The final zone boundary is displayed in the permit drawings (labeled as "Seagrass Mitigation Site"), but posting of this area may be modified by NWR if required. The management plan and lease conditions shall address sign installation, zone boundaries, sign maintenance, enforcement of no motor restrictions, and public education. The permittee shall provide the necessary resources to create the signs and post the signs for as long as the No Motor Zone remains a component of the NWR management plan for the area.

2) Prior to posting, the County shall conduct a training exercise for the Lee County Marine Law Enforcement Task Force to educate them about the new regulations and enforcement options. The Lee County Sheriff's Office will include patrol of this area under its regularly scheduled marine operations.

3) The No Motor Zone shall be posted by the end of the initial Blind Pass dredging event. The signs shall be inspected semi-annually, or within 30 days of any discrepancy

report, to identify any necessary follow-up activity. Follow-up activities shall be completed within 30 days of identification.

4) During preconstruction surveys, the permittee will confirm that there are at least 4.8 acres of prop scarred area within the No Motor Zone that could receive mitigation credit if the scars become filled in with seagrasses. The scarred area shall be documented and monitored over time as described in the monitoring section of the permit.

5) A Control Area shall be established near the throat of Blind Pass in order to compare scarring frequency over time. This Control Area shall serve as a baseline for success of the No Motor Zone scarring frequency reduction.

6) A contingency plan for seagrass mitigation shall be submitted to the Department for review and approval, and implemented if any of the below scenarios are realized during the proposed project:

Scenario 1: The preconstruction aerial photography and field verification activities confirm less than the required 4.8 acres of propeller scars exist within the proposed No Motor Zone. The amount of contingency mitigation required under this option is dependent upon the difference between the required 4.8 acres of mitigation and the acreage of propeller scars calculated through observation and interpretation of the preconstruction aerial photography.

Scenario 2: Seagrass impacts in excess of the authorized 0.72 acres of impact to *Halodule wrightii* are discovered during the post-construction monitoring.

Scenario 3: The permittee is unable to achieve success with the approved seagrass mitigation plan at the end of the five year monitoring period according to the success requirements (see Specific Condition 44). The amount of additional mitigation required will be dependent upon the level of success achieved through the primary mitigation program.

Scenario 1 - Contingency Seagrass Mitigation Plan Option 1: **Transplanting existing *Halodule wrightii* from dredge footprint to specified locations near Ding Darling NWR or Planting of *H. wrightii* from Nursery stock to establish new grassbeds in Dinkins Bayou**

If Scenario 1 is realized, Contingency Plan Option 1 shall be implemented concurrently with the initial Blind Pass dredging event. All required seagrass planting activities shall be completed prior to the completion of the initial Blind Pass dredging event, within the appropriate timelines for seagrass planting activities. If transplanting from impact area, *H. wrightii* shall be harvested from the dredge impact area. Specific planting areas and supporting documentation shall be provided by the Permittee for Department evaluation and approval.

i) **Transplanting to establish new seagrass beds:** Transplantation or planting of seagrasses to existing grades in areas with either sparse seagrasses or without seagrasses has shown limited success. The absence of seagrass on what may appear to be an otherwise suitable site often indicates an inherent problem in seagrass colonization or a temporally dynamic site. Planting among patches of existing natural seagrass should not be conducted because the plantings would only pulse the system and would not create any long-term increase in seagrass acreage. These unvegetated patches within a seagrass bed are usually unvegetated for some reason and the open patches may function as part of the seagrass habitat. These open spaces are soon reestablished at or near the original location.

The Department must receive the following information in order to evaluate any proposed transplantation receiver site:

- Has the planting site supported seagrass in the past?
    - Was it in a continuous or patchy bed?
- What is the existing seagrass cover in the vicinity of the planting site?
- What is the ecological value of the current site as unvegetated soft bottom?
- What is the reason seagrasses are not currently growing in the proposed site?
- If seagrass does not currently exist at this site, provide reasonable assurance that seagrass can be successfully established at this site.
- If this site historically supported seagrass, have the problems that contributed to the decline of seagrass at this site been corrected so that the site will now support seagrass?
- Provide the information indicated on the UMAM Worksheets (Parts I and II) to enable the Department to calculate how much mitigation that would be required.

The proposed seagrass restoration (transplantation) component of the contingency mitigation plan shall provide adequate detail regarding appropriate site selection, water depth through full tidal range, sediment composition, salvage methods, transplantation methods, sediment preparation, equipment, personnel, timing, schedule, seasonality and water quality protection. The plan must provide drawings or figures that that effectively illustrate the proposed restoration techniques and methods. The contingency mitigation plan shall provide specific details concerning seagrass transplanting timelines and seasonality, demonstrate that planting will be conducted during the appropriate seasons, accounting for water temperatures, seagrass growth and senescence, extreme weather conditions, proximity to navigation channel and existing prop scars, seasonal increases in boat traffic, etc., all of which could influence seagrass restoration performance and success. The contingency plan shall also provide a monitoring program that details the monitoring and reporting protocol

and success criteria. The target seagrass community at the seagrass restoration site shall be similar to the impacted community (*Halodule wrightii* at a minimum cover of 10%).

ii) **Transplantation into prop scars:** If the permittee elects to transplant the existing *H. wrightii* within the dredge area or nursery stock to propeller scars within the No Motor Zone under Contingency Plan Option 1, the information described below shall be submitted to the Department for review and approval. Preliminary selection of propeller scar receiver sites within the No Motor Zone shall be performed using aerial photo interpretation techniques. The sites shall be verified in the field for the presence of seagrass within the scar (natural recruitment/recovery) and adjacent to the scar and for plantable unconsolidated sediments within the scar. Plantable unconsolidated sediments in a scar should be medium to fine grain sediment and at least 10 cm thick. Sediment thickness should be determined by inserting a probe into the sediment approximately every 5 m along the length of the scar. Scars should be targeted in areas that at the time of the survey appear to be susceptible to additional erosion and scar expansion, particularly as the result of disturbance caused by water motion (e.g., waves, tidal currents). However, acceptable sites shall not have currents that are great enough to uproot the planted seagrass or scour sediment used to fill the scars. Sediment infilling may be required prior to planting activities to stabilize the scars. DGPS positioning of the scars shall be obtained during these investigations.

In addition to this information, if propeller scars are selected as the restoration sites, the proposed contingency mitigation plan shall provide adequate detail regarding appropriate salvage methods, transplantation methods, equipment, personnel, timing, schedule, seasonality, and water quality protection. The plan shall provide drawings or figures that effectively illustrate the proposed restoration techniques and methods, and provide specific details concerning transplantation timelines and seasonality, accounting for water temperatures, seagrass growth and senescence, and extreme weather conditions. The contingency plan shall also provide a monitoring program that details the monitoring and reporting protocol and success criteria.

Scenario 2: Contingency Seagrass Mitigation Plan Option 2: If secondary impacts in excess of the authorized 0.72 acres of impact to *Halodule wrightii* are discovered during the post-construction monitoring, a detailed contingency plan to address this impact shall be submitted to the Department within 30 days of discovery of impact. Contingency Plan Option 2 shall be implemented within 90 days following approval of the plan by the Department. Options for consideration include restoration of prop scars within the vicinity of Blind Pass, seagrass restoration activities within Clam Bayou and/or establishment of seagrass protection zones/signage to the north of Blind Pass if the reference/control area indicates an increase in propeller scarring.

Scenario 3*: *Contingency Seagrass Mitigation Plan Option 3: If, at the end of the five year monitoring period, the permittee is unable to achieve success with the approved mitigation plan according to the success requirements in Specific Condition 44, a detailed contingency plan to address this failure shall be submitted to the Department for review and approval. This contingency plan shall be submitted to the Department for consideration within 30 days of submittal of the final five-year monitoring report to the Department. The amount of mitigation required will be dependent upon the level of success achieved through the primary mitigation program and the UMAM calculations for any new mitigation. Contingency Plan Option 3 shall be implemented within 90 days following approval of the plan by the Department. Options for consideration include restoration of prop scars within the vicinity of Blind Pass, seagrass restoration activities within Clam Bayou, and/or establishment of seagrass protection zones/signage to the north of Blind Pass if the reference/control area indicates an increase in propeller scarring.

7) In the event that a seagrass planting contingency is required, the required acreage will be achieved from the plantings as measured from the perimeter of beds with at least 10% cover for transplanted and new grassbeds, or as measured by the restored length of replanted prop scars. Because of the site specific nature of the work, in the event that seagrass is planted or transplanted as a contingency requirement of the Mitigation Plan, the monitoring protocol shall be submitted to DEP for review and approval along with the details required for updated UMAM calculations.

18. **Additional public interest.** Implementation and success of the approved mitigation plan is expected to satisfy the minimum acceptable project standards. However, this project is within the Pine Island Sound Aquatic Preserve, Outstanding Florida Waters, and authorization requires the project to be clearly in the public interest. Therefore, the Permittee shall conduct the following activities as enhancements to the project that provide additional public interest:

a. Mangrove. In addition to the planting required for mitigation, the permittee shall install 110 red mangrove seedlings in Blind Pass, on the east side of the new top of cut, adjacent to Subarea 1. These mangroves are expected to enhance stability of the bank and to provide additional fisheries habitat. Reasonable measures to protect the plantings during their establishment will be taken. Such measures may include encasement or use of larger planting materials. However, the Permittee is not required to guarantee their survival.

b. Seagrass. The size of the seagrass protection area shall be in excess of the regulatory requirement.

Additional public interest benefits can be realized if the *H. wrightii* within the channel footprint can be used (by other parties) for other seagrass enhancement or restoration project in this basin that are not required as mitigation. If the Permittee does not elect to utilize this material as donor material for seagrass planting activities required as mitigation, the permittee shall contact

local universities, research and environmental organizations involved in seagrass restoration and research activities to provide notice of availability of seagrass material for harvesting. The permittee shall provide a list of the individuals and organization contacted to the Department, including any of those groups and/or individuals that elect to harvest the material. The permittee will not be responsible for the monitoring and success of any of the projects if the seagrass material is harvested such projects.

c. **Navigation markers.** Recognizing that the historic use by small recreational vessels will return to Blind Pass after project construction, the permittee shall install and maintain in perpetuity additional channel markers and regulatory signs. These signs will be mutually agreed upon by Lee County Division of Natural Resources, DEP Aquatic Preserve staff and National Marine Fisheries Service (per NMFS letter 11/04/06) and are subject to review and approval by law enforcement, the United States Coast Guard and the FWC Boating and Waterways Section.

19. If construction activities (including sand placement, excavation or removal of the containment area or movement of heavy equipment) shall be conducted during the period from April 15 through October 31, daily early morning surveys for sea turtle nests must be initiated 65 days prior to nourishment or by April 15, whichever is later. Nesting surveys shall continue through September 1. If nests are constructed in areas where they may be affected by construction activities, eggs shall be relocated per the requirements listed below.

a. Nesting surveys and egg relocations will only be conducted by personnel with prior experience and training in nesting survey and egg relocation procedures. Surveyors must have a valid FWC permit issued pursuant to Florida Administrative Code Rule 68E-1. Nesting surveys must be conducted daily between sunrise and 9 a.m. The contractor must not initiate work until daily notice has been received from the sea turtle permit holder that the morning survey has been completed. Surveys must be performed in such a manner so as to ensure that construction activity does not occur in any location prior to completion of the necessary sea turtle protection measures.

b. Only those nests that may be affected by construction activities will be relocated. Nests requiring relocation must be moved no later than 9 a.m. the morning following deposition to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. Relocated nests must not be placed in organized groupings; relocated nests must be randomly staggered along the length and width of the beach in settings that are not expected to experience daily inundation by high tides or known to routinely experience severe erosion and egg loss, or subject to artificial lighting. Nest relocations in association with construction activities must cease when construction activities no longer threaten nests. The permittee may be required to undertake predator control activities if relocated nests are predated subsequent to relocation.

c. Nests deposited within areas where construction activities have ceased or will not occur for 65 days must be marked and left *in situ* unless other factors threaten the success of the nest. The turtle permit holder must install an on-beach marker at the nest site and/or a secondary marker at a point landward as possible to assure that future location of the nest

will be possible should the on-beach marker be lost. A series of stakes and highly visible survey ribbon or string must be installed to establish a 10-foot radius around the nest. No activity shall occur within this area or shall any activities occur which could result in impacts to the nest. Nest sites must be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the restoration activity.

20. It is the responsibility of the permittee to ensure that the project area and access sites are surveyed for marine turtle nesting activity.

21. During the sea turtle nesting season, the contractor shall not extend the beach fill more than 500 feet along the shoreline between dusk and the following day until the daily nesting survey has been completed and the beach cleared for fill advancement. Once the beach has been cleared and the necessary nest relocations have been completed, the contractor may proceed with the placement of fill during daylight hours until dusk, at which time the 500-foot length limitation shall apply.

22. The sand containment cell must be constructed such that marine turtles and their hatchlings cannot become entrapped behind or within the structure. The permittee shall arrange for an inspection by FWC staff from the Imperiled Species Management Section upon completion of construction of the containment cell, all pipes to the cell, and access corridors. If this inspection determines the containment area may create unanticipated hazards for nesting marine turtles or their hatchlings, the permittee shall take action to correct any potential hazards. This shall include potential entrapment in the weirs or impacts due to discharge from the containment cell.

a. No exterior lights shall be installed on the containment cell, the access areas, pipes, or any structures associated with the containment cell.

b. Upon completion of the project, all structural materials from the containment cell shall be removed from the beach and the beach in the cell, access areas, and pipe areas shall be restored to grade.

c. Additional sediment sampling may be required to ensure that the beach in the containment cell area contains only beach quality sand similar to the native beach.

23. From May 1 through October 31, all project lighting shall be limited to the immediate area of sand placement and dredging only and shall be the minimal lighting necessary to comply with U.S. Coast Guard and/or OSHA requirements. Stationary lighting on the beach and all lighting on the dredge shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to minimize illumination of the nesting beach and water (Figure 1).

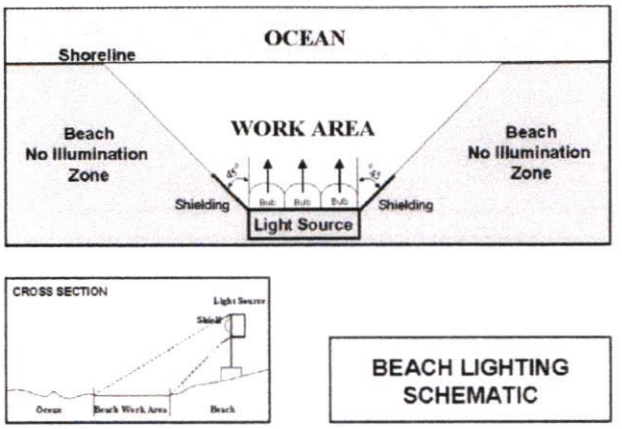


Figure 1

24. Staging areas for construction equipment shall be located off the beach to the maximum extent practicable. Nighttime storage of construction equipment not in use shall be off the beach to minimize disturbance to sea turtle nesting and hatching activities. All construction pipes that are placed on the beach shall be located as far landward as possible without compromising the integrity of the existing or reconstructed dune system or interfering with shorebird nesting. No storage or staging areas shall occur in dredge areas that are less than six feet deep at mean sea level or that have seagrass present.

25. Immediately after completion of the beach fill placement event and prior to April 15 for 3 subsequent years if placed sand still remains on the beach, the beach shall be tilled as described below, or the applicant may follow the procedure outlined below to request a waiver of the tilling requirement. During tilling, at a minimum, the protocol provided below shall be followed:

a. The area shall be tilled to a depth of 24 inches. All tilling activity must be completed prior to May 1.

b. An annual summary of the actions taken, including compaction surveys, shall be submitted to the FWC.

c. If the project is completed just before the nesting season, tilling shall not occur in areas where nests have been left in place or relocated unless authorized by the U.S. Fish and Wildlife Service in an Incidental Take Statement.

d. This condition shall be evaluated annually and may be modified if necessary to address sand compaction problems identified during the previous year.

26. To request a waiver of the tilling requirement, the permittee may measure sand compaction in the area of restoration in accordance with a protocol agreed to by the FWC, the Department, the U.S. Fish & Wildlife Service, and the applicant to determine if tilling is necessary.

a. Compaction sampling stations shall be located at 500-foot intervals along the project area. One station shall be at the seaward edge of the dune/bulkhead line (when material is placed in this area) and one station shall be midway between the dune line and the high water line (normal wrack line).

b. At each station, the cone penetrometer shall be pushed to a depth of 6, 12, and 18 inches three times (three replicates). Material may be removed from the hole if necessary to ensure accurate readings of successive levels of sediment. The penetrometer may need to be reset between pushes, especially if sediment layering exists. Layers of highly compact material may lie over less compact layers. Replicates shall be located as close to each other as possible, without interacting with the previous hole and/or disturbed sediments.

c. The three replicate compaction values for each depth shall be averaged to produce final values for each depth at each station. Reports shall include all 18 values for each transect line, and the final 6 averaged compaction values.

d. If the average value for any depth exceeds 500 psi for any two or more adjacent stations, then that area shall be tilled prior to April 15. If values exceeding 500 psi are distributed throughout the project area but in no case do those values exist at two adjacent stations at the same depth, then consultation with the FWC shall be required to determine if tilling is required. If a few values exceeding 500 psi are present randomly within the project area, tilling shall not be required.

27. Visual surveys for escarpments along the beach fill area shall be made immediately after completion of the beach nourishment project and prior to April 15 for the following two years if placed sand still remains on the beach. All scarps shall be leveled or the beach profile shall be reconfigured to minimize scarp formation. In addition, weekly surveys of the project area shall be conducted during the two nesting seasons following completion of fill placement and reported each month as follows:

a. The number of escarpments and their location relative to DNR-DEP reference monuments shall be recorded during each weekly survey and reported relative to the length of the beach surveyed (e.g., 50% scarps). Notations on the height of these escarpments shall be included (0 to 2 feet, 2 to 4 feet, and 4 feet or higher) as well as the maximum height of all escarpments.

b. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet shall be leveled to the natural beach contour by April 15. Any escarpment removal shall be reported relative to R-monument.

c. If weekly surveys during the marine turtle nesting season document subsequent reformation of escarpments that exceed 18 inches in height for a distance of 100 feet, the FWC shall be contacted immediately to determine the appropriate action to be taken. Upon written notification, the permittee shall level escarpments in accordance with mechanical methods prescribed by the FWC. Scarp surveys shall be conducted weekly and reported monthly to the FWC.

28. A lighting survey shall be conducted from the nourished berm prior to April 1 of the first nesting

season following nourishment and action taken to ensure that no lights or light sources are visible from the newly elevated beach. A report summarizing all lights visible, using standard survey techniques for such surveys, shall be submitted to FWC by April 15 and documenting all compliance and enforcement action. Additional lighting surveys shall be conducted monthly through August and results reported by the 15th of each month.

29. The applicant shall arrange a meeting between representatives of the contractor, the Department, the FWC, and the permitted person responsible for marine turtle nest monitoring at least 30 days prior to the commencement of work on this project. At least 15 days advance notice shall be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures.

30. Reports on all nesting activity shall be provided for the initial nesting season and for a minimum of two additional nesting seasons. Monitoring of nesting activity in the seasons following construction shall include daily surveys and any additional measures authorized by the FWC. Reports submitted shall include daily report sheets noting all activity, nesting success rates, hatching success of all relocated nests, hatching success of a representative sampling of nests left in place (if any), dates of construction and names of all personnel involved in nest surveys and relocation activities. Data should be reported separately for the nourished areas and for an equal length of adjacent beach that is not nourished in accordance with the attached Table. Summaries of nesting activity shall be submitted in electronic format (Excel spreadsheets). All reports should submitted by January 15 of the following year.

Table 1
Marine Turtle Monitoring for Beach Restoration Projects

Characteristic	Parameter	Measurement	Variable
Nesting Success	False crawls - number	Visual assessment of all false crawls	Number and location of false crawls in fill areas and nonfill areas: any interaction of the turtle with obstructions, such as groins, seawalls, or scarps, should be noted.
	False crawl - type	Categorization of the stage at which nesting was abandoned	Number in each of the following categories: emergence-no digging, preliminary body pit, abandoned egg chamber.
	Nests	Number	The number of marine turtle nests in filled and nonfilled areas should be noted. If possible, the location of all marine turtle nests shall be marked on map of project, and approximate distance to sea walls or scarps measured using a meter tape. Any abnormal cavity morphologies should be reported as well as whether turtle touched groins, seawalls, or scarps during nest excavation

		Lost Nests	The number of nests lost to inundation, erosion or the number with lost markers that could not be found.
	Lighting Impacts	Disoriented sea turtles	The number of disoriented hatchlings and adults shall be documented and reported in accordance with existing FWC protocol for disorientation events.
Reproductive Success	Emergence & hatching success	Standard survey protocol	Numbers of the following: unhatched eggs, depredated nests and eggs, live pipped eggs, dead pipped eggs, live hatchlings in nest, dead hatchlings in nest, hatchlings emerged, disoriented hatchlings, depredated hatchlings per each nest.

The above monitoring is required for beach nourishment projects. Reports summarizing the nesting should be submitted to the FWC Tequesta field office with a copy to the FWC Tallahassee office, as well as a copy of the cover letter to DEP, Bureau of Beaches and Coastal Systems by January 15 of the subsequent year. Data for nesting activity on the nourished beach and on an equal length of beach that is not nourished shall be reported separately, and should include numbers of nests lost to erosion or washed out. Summaries of nesting activity shall be submitted in electronic format (Excel spreadsheets).

31. In the event a sea turtle nest is excavated during construction activities, all work shall cease in that area immediately and the permitted person responsible for egg relocation for the project should be notified so the eggs can be moved to a suitable relocation site.

32. Upon locating a dead, injured, or sick endangered or threatened sea turtle specimen, initial notification must be made to the FWC at 1-888-404-FWCC. Care should be taken in handling sick or injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

33. **Shorebird Surveys.** All beach placement sites, storage and access areas, the containment cell, and interior portions of Blind Pass shall be surveyed for shorebirds immediately before, during and after project construction.

a. Monitoring shall also occur at Turner Beach Park and Bowman's Beach to assess if shorebirds are being displaced from foraging and nesting habitats within the project area and concentrated in these other areas.

b. Shorebird surveys should be conducted by trained, dedicated individuals (Shorebird Monitor) with proven shorebird identification skills and avian survey experience. Credentials of the Shorebird Monitor will be submitted to the FWC Regional Biologist for review and approval. Shorebird Monitors will use the following survey protocols.

34. **Nesting Season Surveys**. Shorebird Monitors should review and become familiar with the general information and data collection protocols outlined on the FWC's Beach-Nesting Bird Website (http://myfwc.com/shorebirds/). An outline of what data should be collected, including downloadable field data sheets, is available on the website; at a minimum information on bird species, number, activities and disturbance shall be collected.

a. The nesting season is generally 1 April – 1 September, but some nesting may occur through September. In addition, the imperiled snowy plover (*Charadrius alexandrinus*) may nest as early as February along the west coast and panhandle of Florida.

b. Nesting season surveys shall begin on April 1 (or February 15 in snowy plover habitat) or 10 days prior to project commencement (including surveying activities and other pre-construction presence on the beach), whichever is later, and be conducted daily throughout the construction period or through August, whichever is earlier. Weekly surveys of the project site shall continue through August or through fledgling or loss of identified nests or hatchlings, whichever is later.

c. Nesting season surveys shall be conducted in all potential beach-nesting bird habitat within the project boundaries that may be impacted by construction or pre-construction activities during

the nesting season. Portions of the project in which there is no potential for project-related activity during the nesting season may be excluded.

d. Surveys for detecting new nesting activity will be completed on a daily basis prior to movement of equipment, operation of vehicles, or other activities that could potentially disrupt nesting behavior or cause harm to the birds or their eggs or young.

e. Surveys should be conducted by traversing the length of the project area and visually inspecting, using binoculars or spotting scope, for the presence of shorebirds exhibiting breeding behavior.

f. If an ATV or other vehicle is needed to cover large project areas, the vehicle must be operated at a speed <6 mph, shall be run at or below the high-tide line, and the Shorebird Monitor will stop at no greater than 200 meter intervals to visually inspect for nesting activity.

35. Once breeding is confirmed by the presence of a scrape, eggs, or young, the Bird Monitor will notify the Regional Nongame Biologist of the FWC at (863)648-3205 within 24 hours.

a. All breeding activity will be reported to the Beach-Nesting Bird website within one week of data collection.

b. Observations of non-breeding shorebirds should be reported to the Shorebird-Seabird Occurrence Database, as described below.

36. **Non-Breeding Shorebird Surveys**. Data collected on non-breeding shorebirds should be compatible with, and reported to, the Shorebird-Seabird Occurrence Database (http://myfwc.com/shorebirds/).

a. Surveys for non-breeding shorebirds should begin 14 days prior to construction commencement and be conducted once every 2 weeks for at least one year post-construction. Data collected during these surveys will provide valuable information on the use of nourished beaches to shorebirds.

b. Survey for non-breeding shorebirds will include all potential shorebird habitat within the project boundary.

c. Data should be entered into the database within one month of collection.

37. **Buffer Zones and Travel Corridors.** Within the project area, the permittee shall establish a 300 ft-wide buffer zone around any location where shorebirds have been engaged in nesting behavior, including territory defense. Any and all construction activities, including movement of vehicles, should be prohibited in the buffer zone.

a. The width of the buffer zone shall be increased if birds appear agitated or disturbed by construction or other activities in adjacent areas. If nesting is documented in the

Bowman Beach area, all access shall be restricted to utilizing the Bowman's Beach main trail, which is well landward of the beach. No staging or storage areas shall occur in this part of the beach.

b. Site-specific buffers may be implemented upon approval by FWC as needed.

c. Reasonable and traditional pedestrian access should not be blocked where nesting birds will tolerate pedestrian traffic. This is generally the case with lateral movement of beach-goers walking parallel to the beach at or below the highest tide line. Pedestrian traffic may also be tolerated when nesting was initiated within 300 feet of an established beach access pathway. The permittee shall work with FWC staff to determine if pedestrian access can be accommodated without compromising nesting success.

d. Designated buffer zones must be posted with clearly marked signs around the perimeter. If pedestrian pathways are approved within the 300-foot buffer zone, these should be clearly marked. These markings shall be maintained until nesting is completed or terminated. In the case of solitary nesters, nesting is not considered to be completed until all chicks have fledged.

e. No construction activities, movement of vehicles, or stockpiling of equipment shall be allowed within the buffer area.

38. FWC-approved travel corridors should be designated and marked outside the buffer areas. Heavy equipment, other vehicles, or pedestrians may transit past nesting areas in these corridors. However, other activities such as stopping or turning shall be prohibited within the designated travel corridors adjacent to the nesting site.

a. Where such a travel corridor must be established within the project area it should avoid critical areas for shorebirds (known nesting sites, wintering grounds, FWC-designated Critical Wildlife Areas, and USFWS-designated critical piping plover habitat) as much as possible, and be marked with signs clearly delineating the travel corridor from the shorebird buffer areas described above.

b. To the degree possible, the permittee should maintain some activity within these corridors on a daily basis, without directly disturbing any shorebirds documented on site or interfering with sea turtle nesting, especially when those corridors are established prior to commencement of construction. Passive methods to modify nesting site suitability must be approved by FWC Regional Biologist for that region.

39. **Notification.** If shorebird nesting occurs within the project area, a bulletin board will be placed and maintained in the construction area with the location map of the construction site showing the bird nesting areas and a warning, clearly visible, stating that "BIRD NESTING AREAS ARE PROTECTED BY THE FLORIDA THREATENED AND ENDANGERED SPECIES ACT AND THE STATE and FEDERAL MIGRATORY BIRD ACTS".

40. **Beach Contours.** All tilling and scarp removal should be performed outside the shorebird nesting season. It is the responsibility of the contractors to avoid tilling or scarp removal in areas where nesting birds are present.

a. A relatively even surface, with no deep ruts or furrows, shall be created during tilling. To do this, chain-linked fencing or other material shall be dragged over those areas as necessary after tilling.

b. The slope between the mean high water line and the mean low water line must be maintained in such a manner as to approximate natural slopes.

41. **Placement of Equipment and Sand.** If it will be necessary to extend construction pipes past a known shorebird nesting site or over-wintering area for piping plovers, then whenever possible those pipes should be placed landward of the site before birds are active in that area. No pipe or sand shall be placed seaward of a known shorebird nesting site during the shorebird nesting season.

42. **Manatee protection conditions**. The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero

Beach (1-561-562-3909) for south Florida.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads *Caution: Manatee Area* must be posted. A second sign measuring at least 81/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.

MONITORING REQUIRED:

43. **Water Quality Monitoring.** Turbidity monitoring shall be conducted during construction in the vicinity of the channel, the beach nourishment and nearshore placement sites and the containment area. Turbidity shall be measured at background and compliance stations.

A. ***Dredge Location in Aquatic Preserve***: If compliance readings are more than 0 NTU's above background, construction activities shall cease and not resume until corrective measures have been taken and turbidity has returned to acceptable levels.

Frequency: Every six hours during dredging.

Location: Background: in the opposite direction of the prevailing current flow, clearly outside of any visible turbidity plume generated by the project. Samples shall be collected from the surface and mid-depth.

Compliance: adjacent to the turbidity curtain, no more than 150 meters downcurrent from the dredge site, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

B. ***Dredge Location Seaward of the Blind Pass Bridge***: If compliance readings are 29 NTU's or more above background, construction activities shall cease and not resume until corrective measures have been taken and turbidity has returned to acceptable levels.

Frequency: Every six hours during dredging.

Location: Background: at least 500 meters in the opposite direction of the prevailing current flow, clearly outside of any visible turbidity plume generated by the project. Samples shall be collected from the surface and mid-depth.

Intermediate Station A: no more than 700 meters downcurrent from the dredge site, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

Compliance Station A: no more than 1500 meters downcurrent from the dredge site, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

C. ***Beach Nourishment and Nearshore Placement Site:*** If compliance readings are 29 NTU's or more above background, construction activities shall cease and not resume until corrective measures have been taken and turbidity has returned to acceptable levels.

Frequency: Every six hours during pumping operations, re-grading below the MHW line, or other in-water work.

Location: Background: at a point approximately 500 meters upcurrent from the discharge point, clearly outside of any turbidity plume generated by the project. Samples shall be collected from the surface and mid-depth at the same distance offshore as the compliance station.

Intermediate Station B: at a point no more than 150 meters offshore and no more than 700 meters downcurrent from the point of discharge into State waters, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

Compliance Station B: at a point no more than 150 meters offshore and no more than 1,500 meters downcurrent from the point of discharge into State waters, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

D. ***Containment Area Discharge***: If compliance readings are 29 NTU's or more above background, construction activities shall cease and not resume until corrective measures have been taken and turbidity has returned to acceptable levels.

Frequency: Every two hours during discharge operations.

Location: Background: at a point approximately 500 meters upcurrent from the point where the discharge is re-entering the Gulf of Mexico, clearly outside of any turbidity plume generated by the project. Samples shall be collected from the surface and mid-depth at the same distance offshore as the compliance station.

Intermediate Station C: at a point no more than 150 meters offshore and no more than 700 meters downcurrent from the point of discharge into State waters, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

Compliance Station C: at a point no more than 150 meters offshore and no more

than 1,500 meters downcurrent from the point of discharge into State waters, within the densest portion of any visible turbidity plume. Samples shall be collected from the surface and mid-depth.

Weekly summaries of all monitoring data (including data from the intermediate stations, which is not used for compliance) shall be submitted to the JCP Compliance Officer of the Bureau of Beaches and Coastal Systems and to the Southwest District Office within one week of collection, with documents containing the following information: (1) "**Permit Number 0265943-001-JC**"; (2) "**Blind Pass Maintenance Dredging Project**" (3) dates and times of sampling and analysis; (4) a statement describing the methods used in collection, handling, storage and analysis of the samples; (5) a map indicating the sampling locations, current direction, plume configuration and the location of the dredge and discharge point(s); and (6) a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data. Monitoring reports shall also include the following information for each sample that is taken: a) time of day samples taken; b) depth of water body; c) depth of sample; d) antecedent weather conditions; e) tidal stage and direction of flow; f) wind direction and velocity; and g) DGPS position.

The compliance locations given above shall be considered the limits of the temporary mixing zone for turbidity allowed during construction. If monitoring reveals turbidity levels at the compliance sites are greater than 29 NTUs above the associated background turbidity levels (0 NTUs above associated background turbidity levels when construction is within the OFW boundary), construction activities shall **cease immediately** and not resume until corrective measures have been taken and turbidity has returned to acceptable levels.

44. **Biological Monitoring: Resource and Mitigation Monitoring.** The following section describes the success criteria, monitoring requirements, and reporting requirements for the mitigative activities as well as the monitoring and reporting requirements for the potential secondary impacts of the project. Please note that an initial mitigation report is also required within 90 days of construction completion, as outlined in Specific Condition 17.

a. Turtle Nesting Beach and Dune Vegetation Mitigation Area

1) In the mitigation dune along Captiva Drive: During the first year, the area shall be inspected quarterly to identify any necessary follow-up treatment to remove visible Australian pines. Follow-up activities shall be completed within 30 days of identification. Thereafter, the area shall be inspected annually until no Australian pines are found or for the duration of the permit, whichever is less. Within 30 days of tree removal, a report shall be submitted to DEP describing the number, size, date and location of Australian pines removed from the dune area.

2) In the mitigation area of the northwest terminus at Captiva Drive: During the first year, the area shall be inspected quarterly to identify any necessary follow-up treatment. Exotic vegetation shall be removed after each inspection. In the event the dune area does not have over 50% cover of native dune vegetation and less than 1% exotic vegetation

after two years, monitoring, exotic removal and reporting shall continue until those levels are achieved. The vehicle barrier at the end of Captiva Drive shall be maintained by the permittee as needed for the life of the Blind Pass Maintenance activities. Annual photography of the site shall be used to verify that the vehicle barrier at the end of Captiva Drive is in place and remains functional. At least annually for two years following construction, the Permittee shall report to DEP the percent cover of native and exotic vegetation in the dune restoration area at the northwest terminus of Captiva Drive.

3) Reporting requirements for the dune mitigation areas include quarterly inspections of both areas during the first year and annual inspections until success criteria are confirmed, or until the permit expires, whichever occurs first. Quarterly and annual reports will be due within 30 days of conducting inspections. Reports shall detail tree and exotic removal and include photography of the vehicle barrier.

b. Mangrove Mitigation Area

1) The areas shall be maintained bimonthly for the first year and semi-annually for a minimum of two additional years in accordance with the defined success criteria and the Biological Monitoring Plan. Monitoring and reporting will terminate after three years or until the survival and expansion of plantings and natural recruitment of mangroves has been sufficient to achieve the acreage required by the UMAM calculations and the success criteria are achieved, whichever is longer.

2) The following success criteria must be continuously met for a period of at least three years:

i) Planted species have achieved a minimum 90% cover;
ii) Planted species have achieved a minimum 90% survival, and exhibit vigorous growth characteristics consistent with the species;
iii) Total contribution to percent cover by non-native wetland species and species not listed in 62-340.450, F.A.C. shall be maintained below 10%;
iv) Natural mangrove recruitment is demonstrated and reported in number of seedlings per sampled plot.

3) A report shall be submitted to DEP annually describing percent mortality of planted materials, replanting quantities, extent of exotic vegetation, natural recruitment of both mangroves and undesirable species (as indicated above), and completion schedule of all remedial actions to ensure at least a 90% mangrove survival rate. The report shall be based on monitoring completed annually between August and November to include at a minimum, point intercept transects randomly selected to represent each planting area, detailed fixed sampling plots of approximately 1000 square feet in each planting area, calculations of percent ground cover and bare ground, changes over time, and panoramic color photography from fixed stations in each planting area. The report shall be submitted to DEP within 30 days of completing the monitoring and any associated remedial work,

and shall include the names and qualifications of individuals conducting the monitoring and analyses.

c. No Motor Zone Mitigation Area and Control Area

1) The scarred area within the designated seagrass beds, as measured in the preconstruction monitoring, shall show a reduction of visible scars over the course of the five year monitoring cycle as a result of the No Motor Zone. For purposes of satisfying UMAM requirements, the following two success criteria shall be attained:

i) At least 4.8 acres of scarred area shall be reduced by 50 % (to less than 2.4 acres) by the end of the five year monitoring cycle (note: in calculating acreage of scarring reduction over time, only the scars verified in the preconstruction aerial photography shall be utilized for comparison calculations). Reduction in scarred area shall be confirmed through aerial photointerpretation (i.e., scars not visible in aerial photography) and ground-truthing activities (i.e., detection of new growth of seagrass shoots - leaf and below-ground biomass- within 75% of the scar footprint). If modifications are required and contribute to reductions in pre-project scar area below that required, then the contingency mitigation requirements described under Specific Condition 17 (Mitigation) will apply.

ii) The No Motor Zone shall show a reduction in frequency of scarring over time. This shall be measured by the comparison of the percentage of net reduction of scars (including both new scars and scar loss) in the No Motor Zone as compared to the Control Area (by comparison of scar area to total bed area over time). The No Motor Zone shall show a reduction of scarring frequency of at least 85% over the five year monitoring period as compared to the Control Area.

2) Aerial photography shall be taken not more than 90 days prior to posting of the No Motor Zone (unless specifically authorized by the Department) and repeated after 1, 3, and 5 years. Visible scars and the extent of seagrass coverage within the No Motor Zone and Control Area shall be mapped into a geodatabase using aerial photointerpretation techniques and groundtruthing and total area of scarring compared over time within the No Motor Zone and the Control Area. Rates of change shall be compared between the No Motor Zone and the Control Area.

3) Ground-truthing activities shall be conducted in both the Control Area and No Motor Zone areas to verify the photointerpretation of aerial photography during each survey. The ground-truthing methods shall provide sufficient data to verify that the photointerpretation of scar footprints is accurate and accounts for natural regrowth / recovery of seagrass within scars. New growth of seagrass within prop scars is not visible using aerial photointerpretation methods due to the shorter blade lengths of young short shoots. A sufficient number of scars must be assessed for physical conditions that may

prevent natural healing and recovery, such as scar width, depth, sand movement within scars and/or accumulations of drift algae. Representative ground-truthing shall be conducted within each class of scars as defined in the aerial imagery analysis and within each of the scarring areas in the no-motor zone as defined by the FWRI classification scheme (light, moderate and severe). The permittee must provide the Department with reasonable assurance that their aerial photointerpretation of propeller scars is accurate.

4) In the Control Area, the Permittee shall determine the annual increase in scarring between 2003 and the date of the establishment of the No Motor Zone using the results of the aerial photointerpretation and ground-truthing of the preconstruction survey. Then, the annual increase in scarring between 1993 and the preconstruction survey shall be calculated. This annual increase in scarring shall be used for comparison to post-project scarring in the assessment of secondary impacts attributed to an increase in boat traffic associated with opening of Blind Pass. If the three-year average post-construction scarring in the control area exceeds the annual increase in scarring between 1993 and the baseline survey by more than 5%, it shall be considered documentation of additional secondary impacts associated with increased boat traffic and shall trigger the contingency plan requirements as stated in the specific conditions of the permit.

5) In addition to the preconstruction updates and post construction mitigation report, annual reports are required to be submitted after year 1, 3 and 5 showing the aerial photography, photointerpretation techniques, and groundtruthing verification. A summary of the reduction (or gain) of visible scars in the No Motor Zone shall be presented. In addition, the rates of scarring frequency of the No Motor Zone shall be compared to the Control Area. Annual surveys shall be taken within the same timeframe as the initial posting, unless authorized by the Department. Reports are required to be submitted to the Department within 90 days of annual surveys.

d. Secondary Impacts within the area of influence of the channel cut

1) Pre-project seagrass areas within 500' of the channel cut (Figure 10c) shall not show secondary seagrass impacts from shoaling, sloughing, scour, or prop scarring. Secondary impacts shall be assessed according to the Biological Monitoring Plan and may trigger the contingency mitigation requirement. The interior area described in the physical monitoring plan shall be evaluated for impacts to seagrass from shoaling, sloughing and scour. The edge of seagrass beds within a 500 foot buffer of the channel footprint shall be mapped prior to the start of construction (time zero, T_0) as late as possible during the growing season (May 1 – October 31) using a submeter accuracy DGPS and integrated datalogger (Trimble GeoXT). Seagrass bed edges shall be updated annually in the same timeframe as the initial mapping for a period of five years. During mapping of the seagrass edge, the biologist shall note seagrass species, and DGPS positioning shall be recorded for changes in species along the edges. Upon completion of physical monitoring events, areas of shoaling, sloughing and scour will be evaluated to determine if there is an overlap with the T_0 seagrass area and subsequent annual seagrass cover. Areas of overlap will be quantified to determine the extent to which the limit of seagrass coverage has

changed in response to the physical change and will be evaluated in conjunction with the results of the biological monitoring.

2) Qualitative Sampling (reconnaissance level transects): The assessment of bed density and species composition shall be performed using a combination of line-intercept and point quadrat samples during each survey. Dependent upon the limits of the seagrass area as mapped during each survey, a reconnaissance level survey shall be performed within the seagrass areas to identify the extent, general cover, species composition and condition of the beds. A sufficient number of transect lines shall be run perpendicular to the axis of the channel dredge area to the east and to the northeast (diagonal) from the channel dredge area (see Figure 10c of the Mitigation Plan for representative transect locations and headings). DGPS positioning of the end points of the transects and the headings shall be recorded in the field. A diver shall swim the transect lines noting the linear extent of bottom type within a 1-meter-wide area centered on the transect line. Qualitative categories of bottom type within the 1-meter wide area under the transect line shall include: seagrass (with indication of single or mixed species composition) at less than < 25% total cover, seagrass 25-50% total cover, seagrass 50-75% total cover and seagrass at > 75% total cover. During these transect swims, divers shall note the presence and number of propeller scars within the beds and record DGPS positioning of large propeller scars that extend for a distance of 25 linear feet or greater.

3) Quantitative Sampling (point-intercept quadrat sampling): To quantitatively describe seagrass cover within the areas and allow for the evaluation of changes in seagrass percent cover and extent related to the effects of sedimentation and scour, a number of point-intercept quadrat samples shall be evaluated within each of the five areas identified in Figure 10c of the Mitigation Plan. Within each of the five areas identified in Figure 10c, the following number of sample points shall be randomly established: Area 1: 3 samples; Area 2: 5 samples; Area 3: 10 samples; Area 4: 3 samples; and Area 5: 5 samples. These samples shall consist of a randomly selected DGPS point within each area, and extending a transect at a random heading for a length of 10 meters from each sample point. DGPS sample points and headings shall be repeated during each annual survey.

Point-intercept samples consisting of a 0.5 m^2 quadrat shall be evaluated at 0, 3, 6, and 9 meters along each of the 10 meter transects. Visual percent cover shall be estimated for all seagrass species occurring in the quadrat, and a score based on the cover of the species in that quadrat shall be assigned according to the Braun-Blanquet abundance scale.

4) Annual reports shall contain an analysis of secondary impacts based upon the results of the physical and biological monitoring. A preconstruction report, as well as annual reports for five years, shall be required. Seagrass mapping in addition to the line-intercept data, coupled with the point quadrat data across the transect lines, will provide detailed information regarding potential impacts to seagrasses within 500 feet of the channel dredging area. Upon completion of physical monitoring events, areas of shoaling, sloughing and scour shall be evaluated to determine if there is an overlap with the T_0 seagrass area and subsequent annual seagrass cover. Areas of overlap shall be quantified

to determine the extent to which the limit of seagrass coverage has changed in response to the physical change and shall be evaluated in conjunction with the results of the biological monitoring. Annual reports shall report and summarize data, noting any project-caused impacts. Annual reports are required to be submitted within 90 days of surveys.

e. ***Inspection of regulatory markers***

1) Inspections of markers shall be completed semi-annually or within 30 days of any discrepancy report to identify any necessary follow-up activity. Follow-up activities shall be completed within 30 days of identification.

2) Conditions of signage shall be reported along with the scar change analysis.

45. **Physical Monitoring:** Pursuant to 62B-41.005(16), F.A.C., physical monitoring of the project is required through acquisition of project-specific data to include, at a minimum, topographic and bathymetric surveys of the inlet, beach, offshore, and borrow site areas, aerial photography, inlet hydraulics data, and engineering analysis. The monitoring data is necessary in order for both the project sponsor and the Department to regularly observe and assess, with quantitative measurements, the performance of the project, any adverse effects which have occurred, and the need for any adjustments, modifications, or mitigative response to the project. The scientific monitoring process also provides the project sponsor and the Department information necessary to plan, design, and optimize subsequent follow-up projects, potentially reducing the need for and costs of unnecessary work, as well as potentially reducing any environmental impacts that may have occurred or be expected.

Prior to issuance of the Notice to Proceed, the permittee shall submit a detailed Monitoring Plan subject to review and approval by the Department. The Monitoring Plan shall indicate the project's predicted design life.

The approved Monitoring Plan can be revised at any later time by written request of the permittee and with the written approval of the Department. If subsequent to approval of the Monitoring Plan there is a request for modification of the permit, the Department may require revised or additional monitoring requirements as a condition of approval of the permit modification.

As guidance for obtaining Department approval, the plan shall generally contain the following items:

a. Topographic and bathymetric profile surveys of the inlet, beach and offshore shall be conducted within 90 days prior to commencement of construction, and within 60 days following completion of construction of the project. Thereafter, monitoring surveys shall be conducted annually. The monitoring surveys shall be conducted during a spring or summer month and repeated as close as practicable during that same month of the year. If the time period between the immediate post-construction survey and the first annual monitoring survey is less than six months, then the permittee may request a postponement of the first monitoring survey until the following spring/summer. A prior design survey of the inlet, beach and offshore may be submitted for the pre-construction survey if consistent with the other requirements of this condition.

The monitoring area shall include profile surveys at each of the Department of Environmental Protection's DNR reference monuments and at intermediate stations south of Blind Pass to include the bounds of the beach fill area and at each of the Department of Environmental Protection's DNR reference monuments extending along at least 5,000 feet south of the beach fill area. All work activities and deliverables shall be conducted in accordance with the latest update of the Bureau of Beaches and Coastal Systems (BBCS) *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 and 01100.*

b. Bathymetric surveys of the inlet and offshore area(s) shall be conducted within 90 days prior to commencement of construction, and within 60 days following completion of construction of the project concurrently with the beach and offshore surveys required above. Thereafter, monitoring surveys of the inlet and offshore areas shall be conducted annually concurrently with the beach and offshore surveys required above. A prior design survey of the inlet area may be submitted for the pre-construction survey if consistent with the other requirements of this condition.

Survey grid lines across the inlet shall be spaced to provide sufficient detail for accurate volumetric calculations but spaced not more than a maximum of 500 feet apart. Inlet channel throat cross-section shall be obtained and used in the inlet hydraulics computations. Bathymetric surveys of the entire shoal complex, including any attachment bars, shall be conducted. In all other aspects, work activities and deliverables shall be consistent with the BBCS *Monitoring Standards for Beach Erosion Control Projects, Section 01200.*

c. Aerial photography of the inlet and beach shall be taken concurrently with the post-construction survey and each annual monitoring survey required above, as close to the date of the beach profile surveys as possible. The limits of the photography shall include the surveyed monitoring area as described above. All work activities and deliverables shall be conducted in accordance with the latest update of the BBCS *Monitoring Standards for Beach Erosion Control Projects, Section 02000 – Aerial Photography Acquisition.*

d. Inlet hydraulics data shall be obtained commencing within six weeks of opening the inlet to tidal flow. Subsequent annual monitoring shall generally coincide with the surveys required in a. and b. above. Concurrent measurements of tidal amplitude shall be obtained in Pine Island Sound, Wulfert Channel, and the Gulf of Mexico within the project area. Current velocities shall be measured within the Blind Pass channel throat. The inlet hydraulics data set shall be obtained for a minimum 30-day period.

e. The permittee shall submit an engineering report and the monitoring data to the BBCS within 90 days following completion of the post-construction survey and each annual monitoring survey. The survey data and control information shall be submitted as specified in the *Statewide Coastal Monitoring Program, Regional Data Collection and Processing Plan, Monitoring Plan Technical Specifications*. The report shall summarize and discuss the data, the performance of the inlet (including its channel shoaling, ebb shoal growth, and inlet geometric and hydraulic stability), the beach fill project, and identify erosion and accretion patterns within the monitored

area. In addition, the report shall include a comparative review of project performance to performance expectations and identification of adverse impacts attributable to the project. The report shall up-date the inlet sediment budget using the monitoring data obtained from this project and the Captiva-Sanibel Island Beach Restoration Project.

Appendices shall include plots of survey profiles and graphical representations of volumetric and shoreline position changes for the monitoring area. Results shall be analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction.

f. Monitoring reports and data shall be submitted to the Bureau of Beaches and Coastal Systems in Tallahassee. Failure to submit reports and data in a timely manner constitutes grounds for revocation of the permit. When submitting any monitoring information to the Bureau, please include a transmittal cover letter clearly labeled with the following at the top of each page: **"This monitoring information is submitted in accordance with Specific Condition No. 45 of the approved Physical Monitoring Plan for Permit No. 0265943-001-JC for the monitoring period[XX]".**

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

_____

Michael R. Barnett, P.E., Chief
Bureau of Beaches and Coastal Systems

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

_____

Deputy Clerk Date

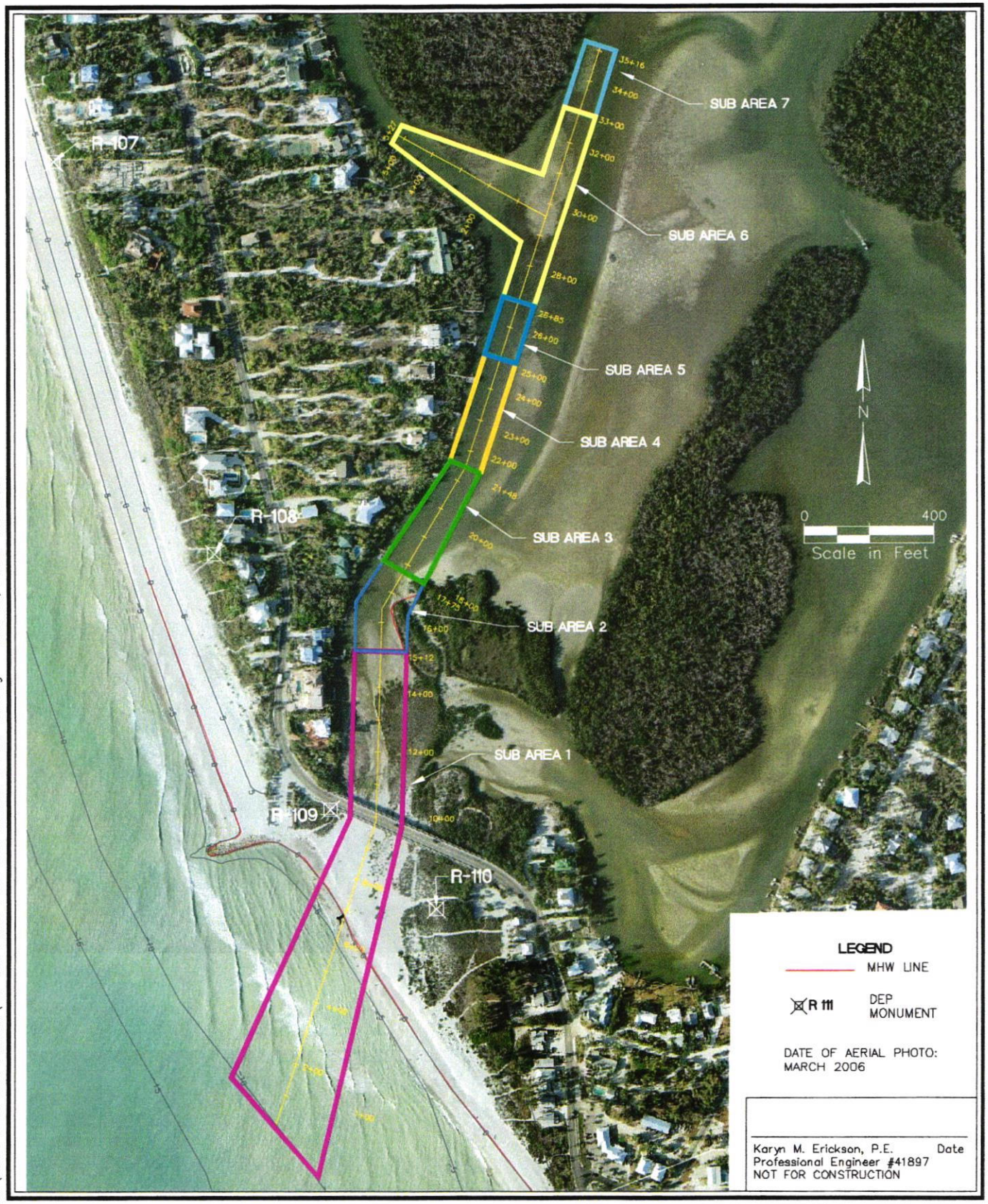
Prepared by Lainie Edwards.

Attachments: Permit Drawings (36 pages)

Note: The attachments are not included with the Draft Permit

See DEP Bureau of Beaches and Coastal Systems website (http://bcs.dep.state.fl.us/env-prmt/lee/issued/0265943_Blind_Pass/001-JC/Final_Order/) for the following Department approved plans:

Sediment QA/QC Plan
Mitigation Plan
Monitoring Plan
Physical Monitoring Plan
Shorebird Management Plan



Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

C:\Civil 3D Projects\Blind Pass New Permit\05-129 Blind Pass New Permit 12-31-07.dwg Jan 14, 2008-10:49am

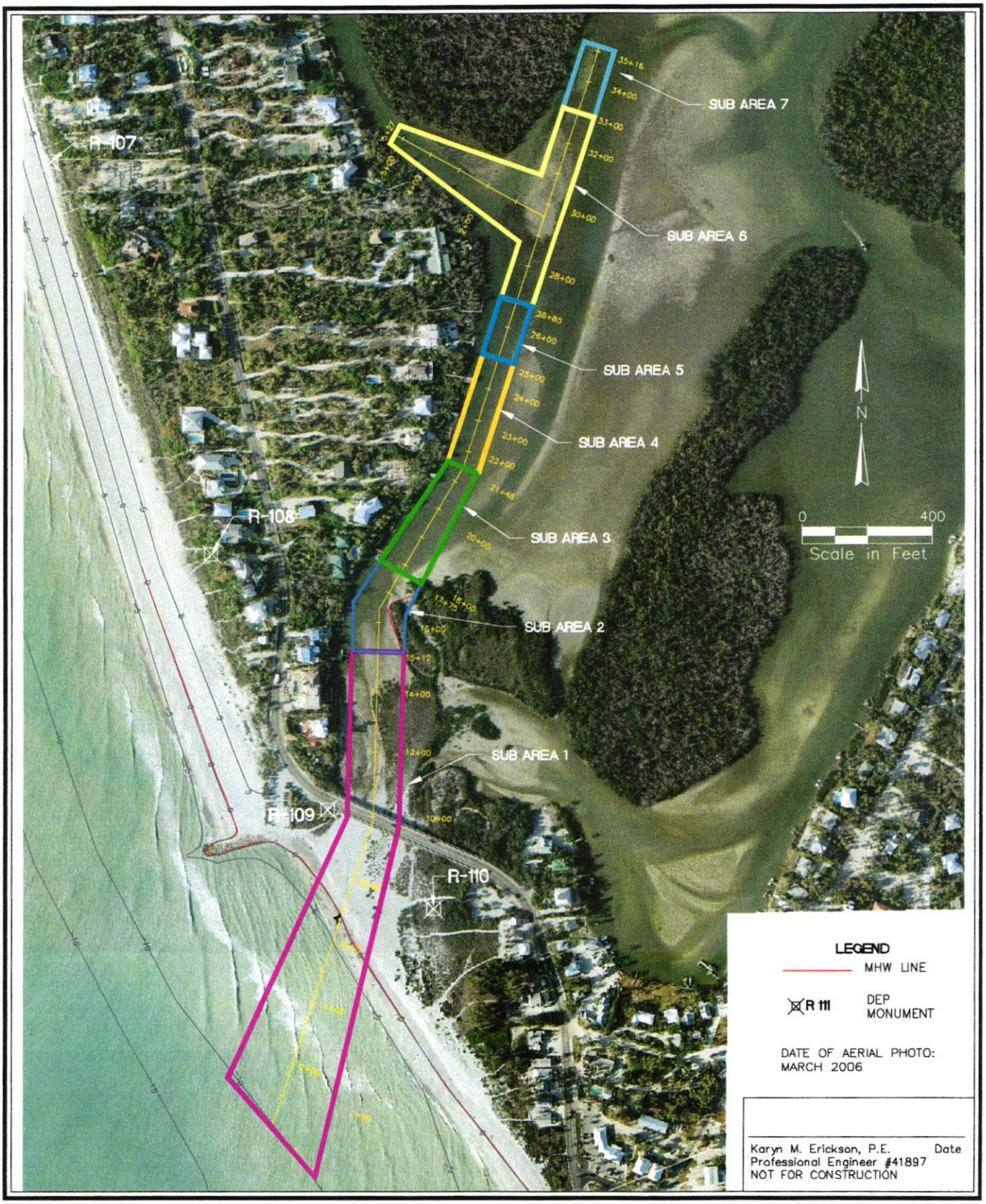
ECE
Erickson Consulting Engineers
7201 Delainey Court
Sarasota, FL 34240
(941) 373-6460

PLAN VIEW – CHANNEL DREDGING SUB AREAS

BLIND PASS RESTORATION
LEE COUNTY, FLORIDA

REVISIONS
DEC 2007

PROJECT 05-129	CHECKED BY KE
DATE 11/05/07	DRAWN BY JE
SCALE 1"=100'	SHEET: 8 of 36



Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

C:\Civil 3D Projects\Blind Pass New Permit\05-129 Blind Pass New Permit 12-31-07.dwg Jan 14, 2008-10:49am

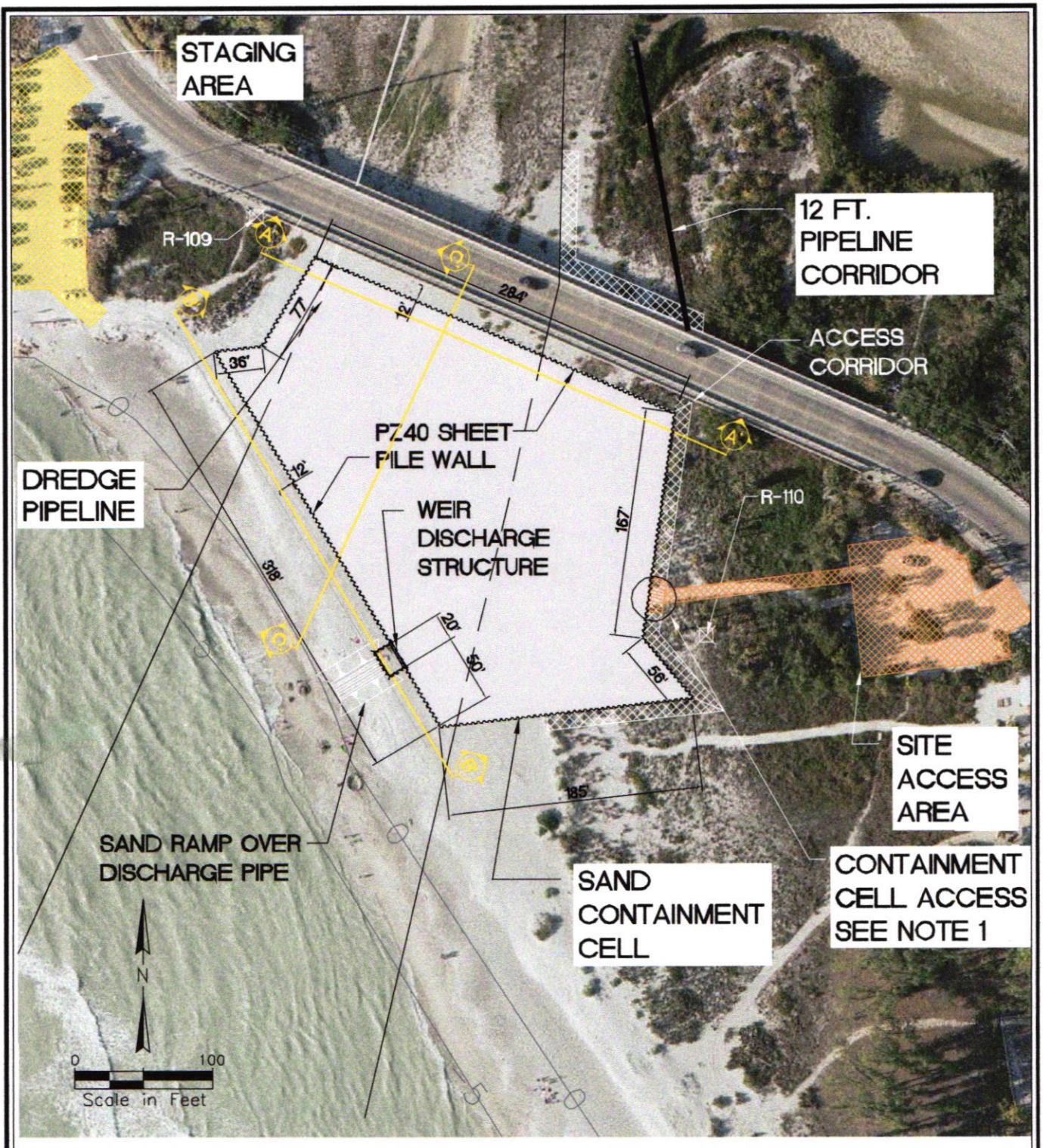
ECE
Environmental Consulting Engineers
7201 Delainey Court
Sarasota, FL 34240
(941) 373-6460

PLAN VIEW – CHANNEL DREDGING SUB AREAS

BLIND PASS RESTORATION
LEE COUNTY, FLORIDA

REVISIONS
DEC 2007

PROJECT 05-129	CHECKED BY KE
DATE 11/05/07	DRAWN BY JE
SCALE 1"=100'	SHEET: 8 of 36



NOTES:
1. BERM TO PROVIDE CONTRACTOR ACCESS TO CONTAINMENT CELL. SHEETPILE MAY BE DELETED AND TWENTY (20) FOOT SAND BERM MAY BE CONSTRUCTED TO REPLACE SHEETPILE. ELEVATION MAY VARY +8' TO +10'.
2. FINAL PLAN AREA FOR CONTAINMENT MAY BE LESS THAN THAN SHOWN IN THE DRAWINGS.

Karyn M. Erickson, P.E. Date
Professional Engineer #41897
NOT FOR CONSTRUCTION

ECE
Environmental Consulting & Engineering
7201 Delainey Court
Sarasota, FL 34240
(941) 373-6460

SAND CONTAINMENT SITE
PLAN VIEW

BLIND PASS RESTORATION
LEE COUNTY, FLORIDA

REVISIONS
DEC 2007

PROJECT 05-129	CHECKED BY KE
DATE 11/05/07	DRAWN BY JE
SCALE 1"=100'	SHEET: 28 of 36

C:\Civil 3D Projects\Blind Pass New Permit\05-129 Blind Pass New Permit 12-31-07.dwg Jan 14, 2008-1:12pm

H:\CADD_Graphics\Blind Pass Restoration\Planning & Permiting\Preferred Design\05-129 Plan View Preferred Design.dwg 5/18/2006 1:49:28 PM EDT

ECE
Erickson Consulting Engineers
1819 Main St., Suite 402
Sarasota, FL 34236
(941) 952-0487

FIGURE 2 GENERAL PLAN VIEW OF CHANNEL ALTERNATIVES

Blind Pass Restoration
Lee County, Florida

REVISIONS

PROJECT 05129	CHECKED BY
DATE 04/28/06	DRAWN BY JE
SCALE Scale	SHEET: 1 of 1

SCALE:	1"=500'
SHEET:	01 OF 01
FILE:	S:\NATRES\MARINE\BEACHMANAGEMENT\BLINDPASS\DRAWINGS\CORELOCAT.dwg
DESIGN:	
DRAWN:	
APPROVED:	

LEE COUNTY
SOUTHWEST FLORIDA

NATURAL RESOURCES DIV
1500 Monroe St. Fort Myers, Florida 33901
Ph. (239) 479-8109/10 Fax. (239) 479-8108

TITLE:

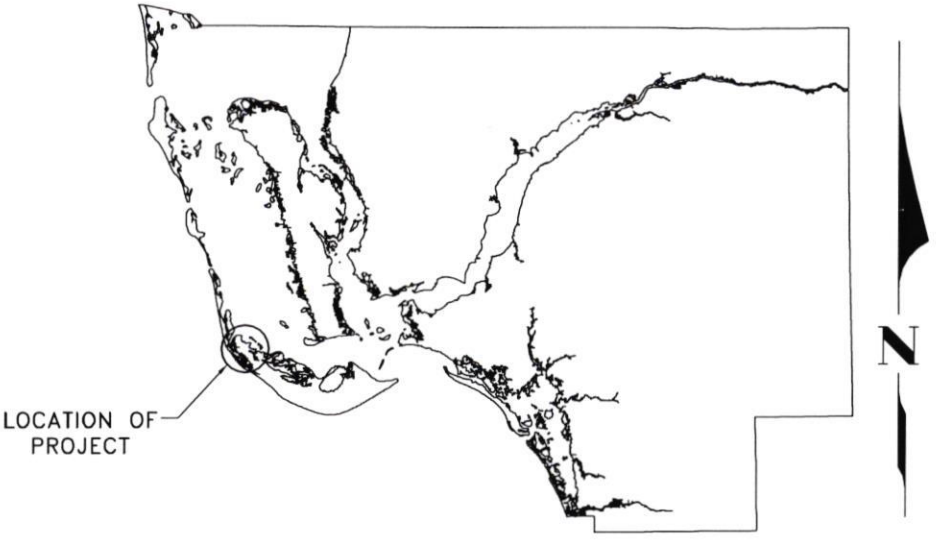
FIGURE 1
BLIND PASS RESTORATION
CONCEPTUAL DESIGN
PLAN VIEW

BLIND PASS MAINTENANCE DREDGING
PERMIT PLANS

PREPARED FOR

LEE COUNTY BOARD OF COUNTY COMMISSIONERS

INDEX:



LEE COUNTY
N.T.S.

GENERAL NOTES:

1. AERIAL PHOTOGRAPHS PROVIDED BY LEE COUNTY, DATED JANUARY 2010.
2. PROJECT LIMITS ALONG THE BEACH EXTEND FROM R95 SOUTH TO R118.
3. CONTRACTOR SHALL FIELD VERIFY LOCATION OF TERMINAL GROIN.

SURVEY NOTES:

1. ELEVATIONS REFERENCE NAVD88.
2. COORDINATES SHOWN HEREON ARE BASED ON THE NORTH AMERICAN DATUM 1983/1990 ADJUSTMENT, FLORIDA MERCATOR WEST ZONE.
3. BLIND PASS CHANNEL BATHYMETRIC SURVEY BY COASTAL ENGINEERING CONSULTANTS, INC., JANUARY 2010.
4. BEACH PROFILE SURVEY FOR R110 TO R118 BY COASTAL ENGINEERING CONSULTANTS, INC., SEPTEMBER 2009.
5. BEACH PROFILE SURVEY FOR R95 TO R109 BY COASTAL, PLANNING & ENGINEERING (CPE), SEPTEMBER 2009.
6. MHW & MLW DATA TAKEN FROM CAPTIVA NOURISHMENT 1 YEAR MONITORING REPORT (CPE, 2007).

COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

SHEET 1 OF
FILE NO.: 10058-P-1

COASTAL ENGINEERING CONSULTANTS INC.
A CECI GROUP COMPANY
Serving Florida Since 1977
3106 SOUTH HORSESHOE DRIVE
NAPLES, FLORIDA 34104

CIVIL ENGINEERING
SURVEY & MAPPING
COASTAL ENGINEERING
ENVIRONMENTAL
PLANNING SERVICES
PHONE: (239)643-2324
FAX: (239)643-1143
www.coastalengineering.com
E-Mail: info@cecifl.com

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: COVER SHEET

DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 10058_P1.dwg			
REF. NO. 10.058			

NO.	DATE	BY	REVISION DESCRIPTION

DREDGING NOTES:

1. THE MAINTENANCE DREDGING ENTAILS REMOVAL OF UP TO 90,000 CY.

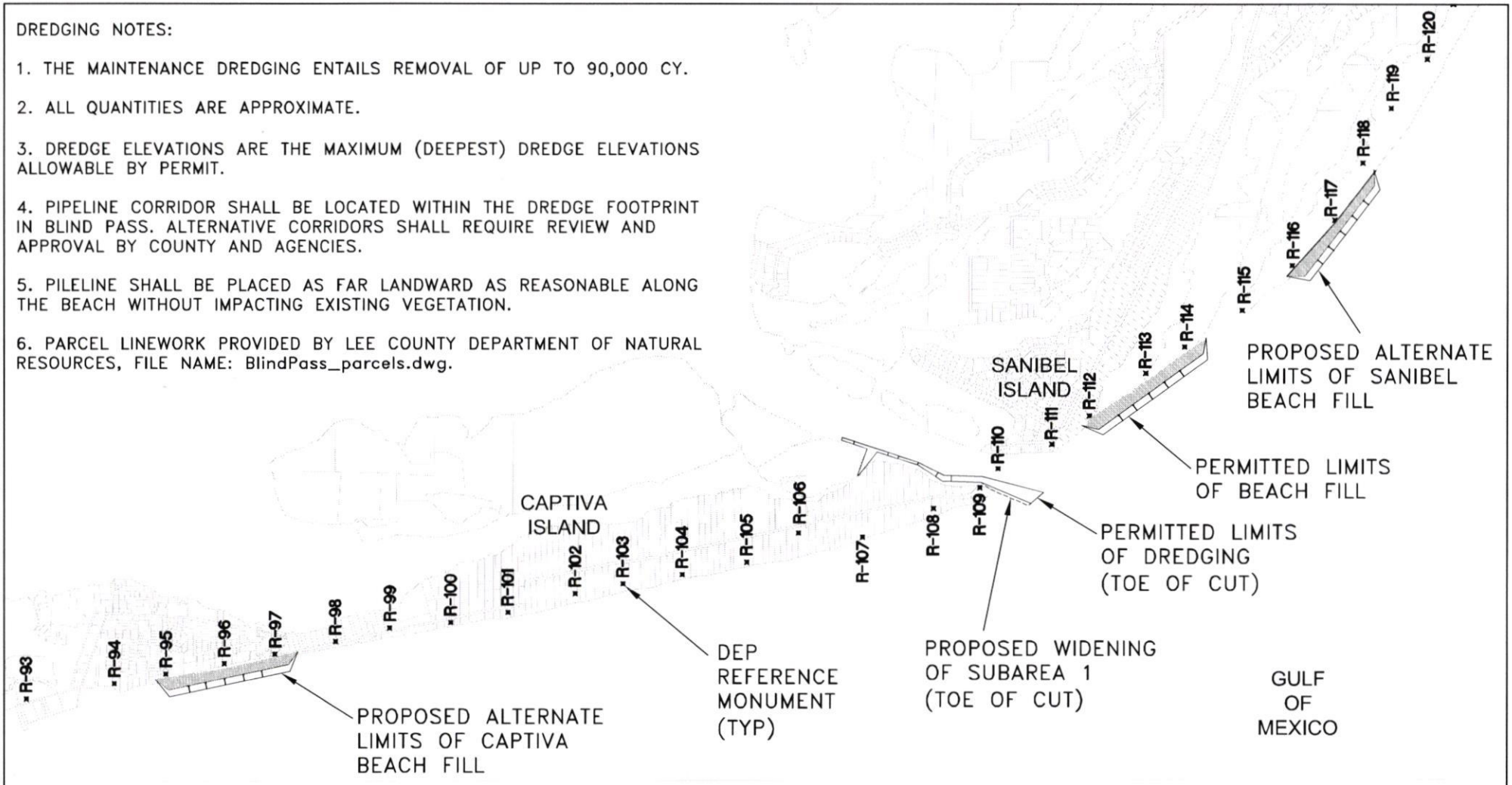
2. ALL QUANTITIES ARE APPROXIMATE.

3. DREDGE ELEVATIONS ARE THE MAXIMUM (DEEPEST) DREDGE ELEVATIONS ALLOWABLE BY PERMIT.

4. PIPELINE CORRIDOR SHALL BE LOCATED WITHIN THE DREDGE FOOTPRINT IN BLIND PASS. ALTERNATIVE CORRIDORS SHALL REQUIRE REVIEW AND APPROVAL BY COUNTY AND AGENCIES.

5. PILELINE SHALL BE PLACED AS FAR LANDWARD AS REASONABLE ALONG THE BEACH WITHOUT IMPACTING EXISTING VEGETATION.

6. PARCEL LINEWORK PROVIDED BY LEE COUNTY DEPARTMENT OF NATURAL RESOURCES, FILE NAME: BlindPass_parcels.dwg.



N

0 1250 2500 5000

SCALE: 1" = 2500'

COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
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DATE OF SIGNATURE:

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www.coastalengineering.com
E-Mail: info@cecifl.com

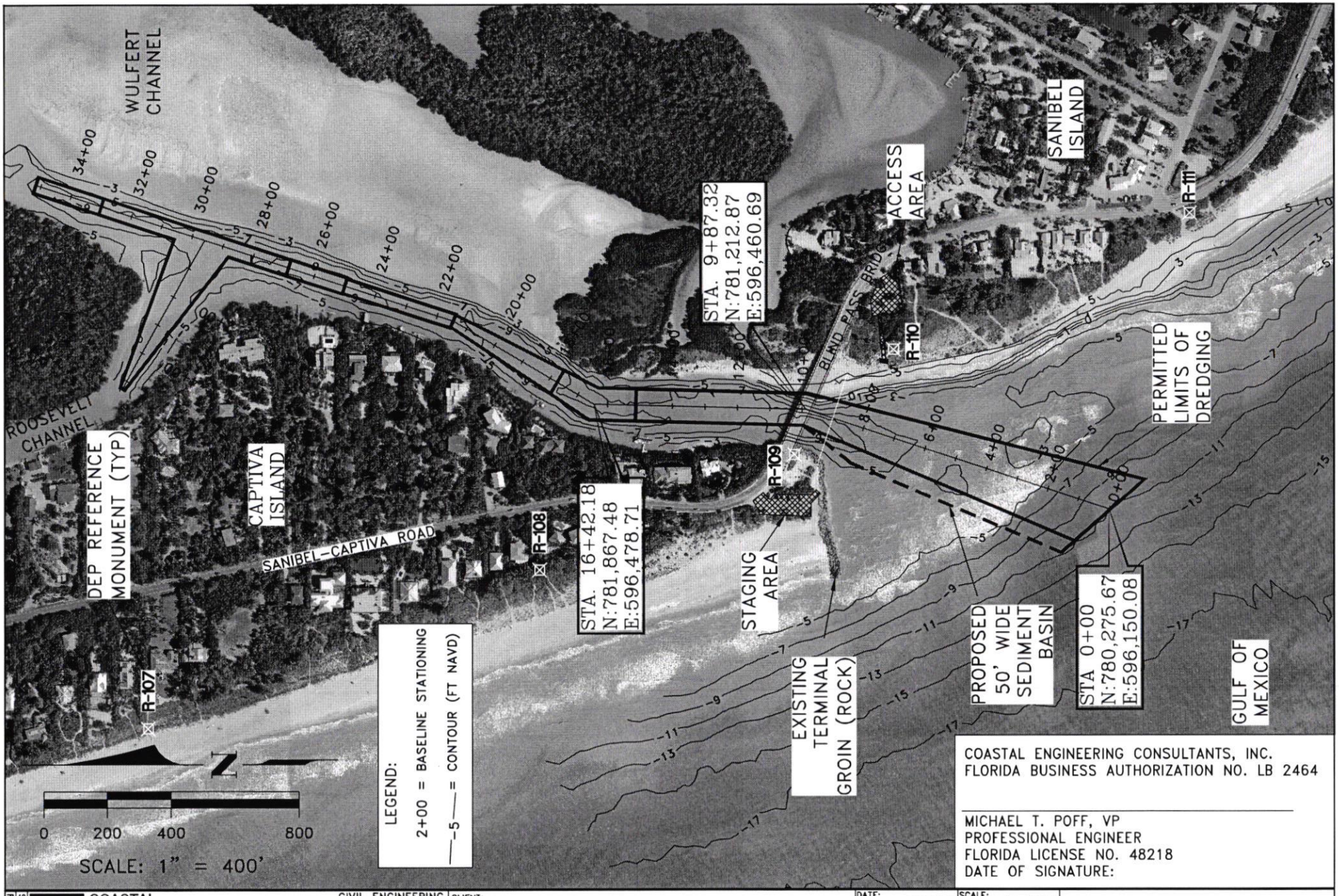
FILE NO.: 10058-P-2 SHEET 2 OF

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: LOCATION MAP

DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO.	10058_P2.dwg		
REF. NO.	10.058		

NO.	DATE	BY	REVISION DESCRIPTION



COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

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E-Mail: info@cecifl.com

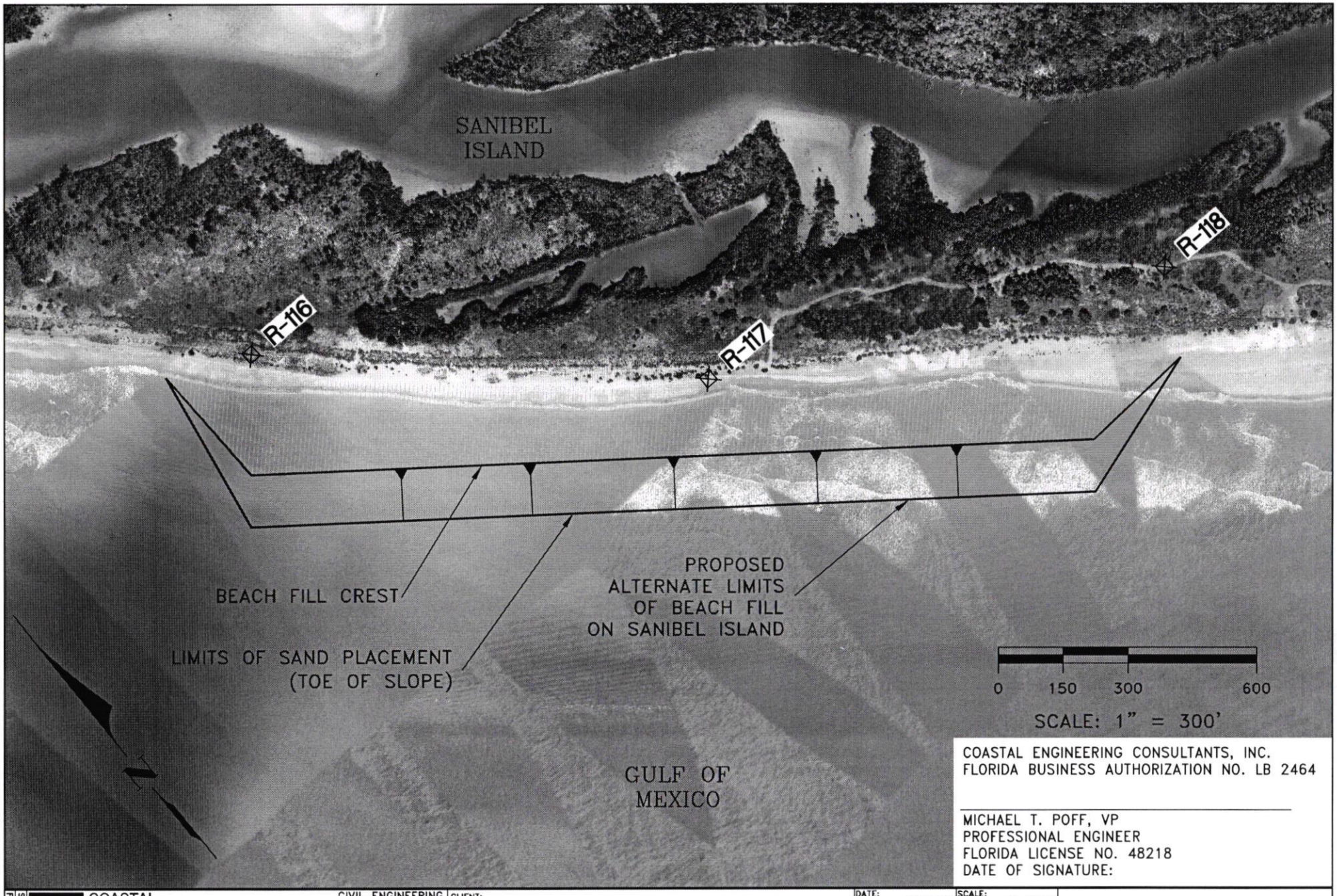
SHEET 3 OF 13
FILE NO.: 10058-P-3

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: DREDGE SITE PLAN

DATE: 8/10/10		SCALE: AS NOTED	
DRAWN: SDO		F.B.	
CHECKED: MTP		PG.	
SEC.	TWP.	RNG.	
ACAD NO.	10058_P3.dwg		
REF. NO.	10.058		

NO.	DATE	BY	REVISION DESCRIPTION



COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

SHEET 4 OF
FILE NO.: 10058-P-4

COASTAL ENGINEERING CONSULTANTS INC.
A CECI GROUP COMPANY
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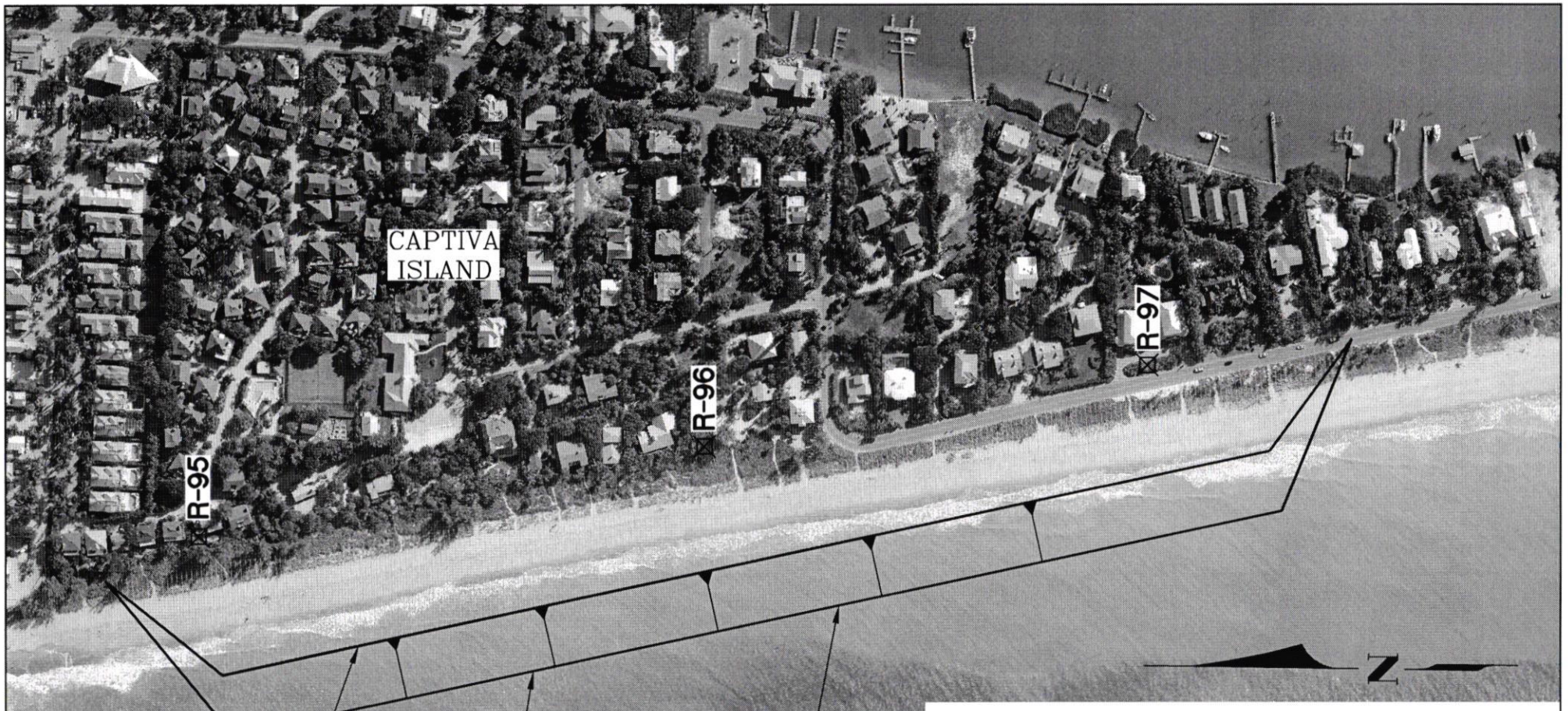
FAX: (239)643-1143
www.coastalengineering.com
E-Mail: info@cecifl.com

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: SANIBEL BEACH FILL

DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO.	10058_P4.dwg		
REF. NO.	10.058		

NO.	DATE	BY	REVISION DESCRIPTION



0 150 300 600

SCALE: 1" = 300'

COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

COASTAL ENGINEERING CONSULTANTS INC.
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E-Mail: info@cecifl.com

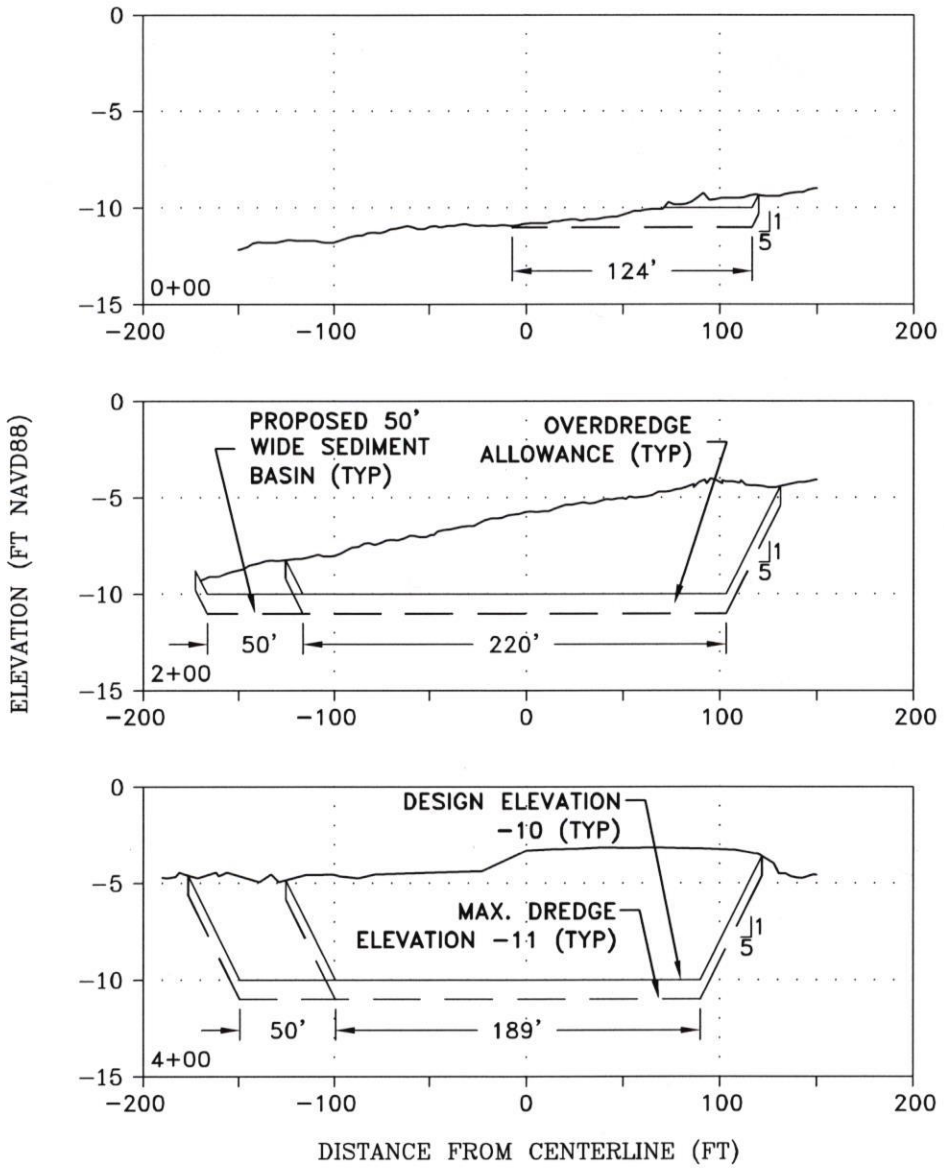
SHEET 5 OF
FILE NO.: 10058-P-5

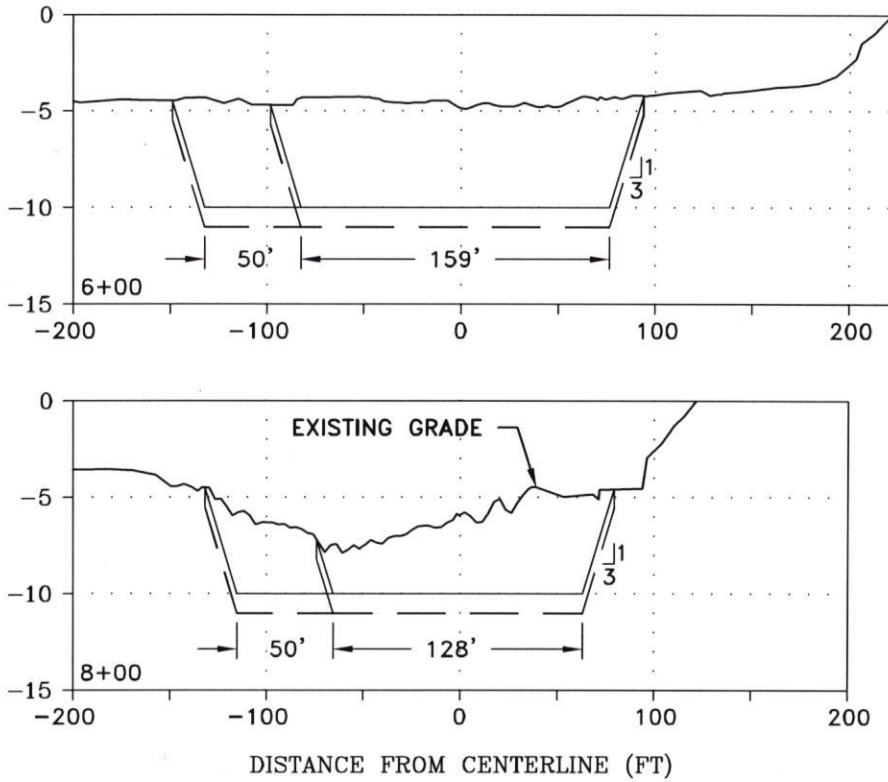
CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: CAPTIVA BEACH FILL

DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO.	10058_P5.dwg		
REF. NO.	10.058		

NO.	DATE	BY	REVISION DESCRIPTION





NOTES:

1. BATHYMETRIC SURVEY CONDUCTED BY COASTAL ENGINEERING CONSULTANTS, INC., JANUARY 2010.
2. ELEVATIONS SHOWN HEREON ARE BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD 1988).
3. HYDROGRAPHIC SURVEY ACCURACIES AND PROCEDURES ARE IN ACCORDANCE WITH GENERAL SURVEY STANDARDS, AS DEFINED BY THE U.S. ARMY CORPS OF ENGINEERS, HYDROGRAPHIC SURVEY MANUAL.
4. INFORMATION SHOWN HEREON REFLECTS CONDITIONS AS THEY EXISTED ON THE SURVEY DATE SHOWN AND CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS AT THAT TIME.

SCALE:
H: 1" = 100'
V: 1" = 10'

COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

COASTAL ENGINEERING CONSULTANTS INC.
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FAX: (239)643-1143
www.coastalengineering.com
E-Mail: info@cecifl.com

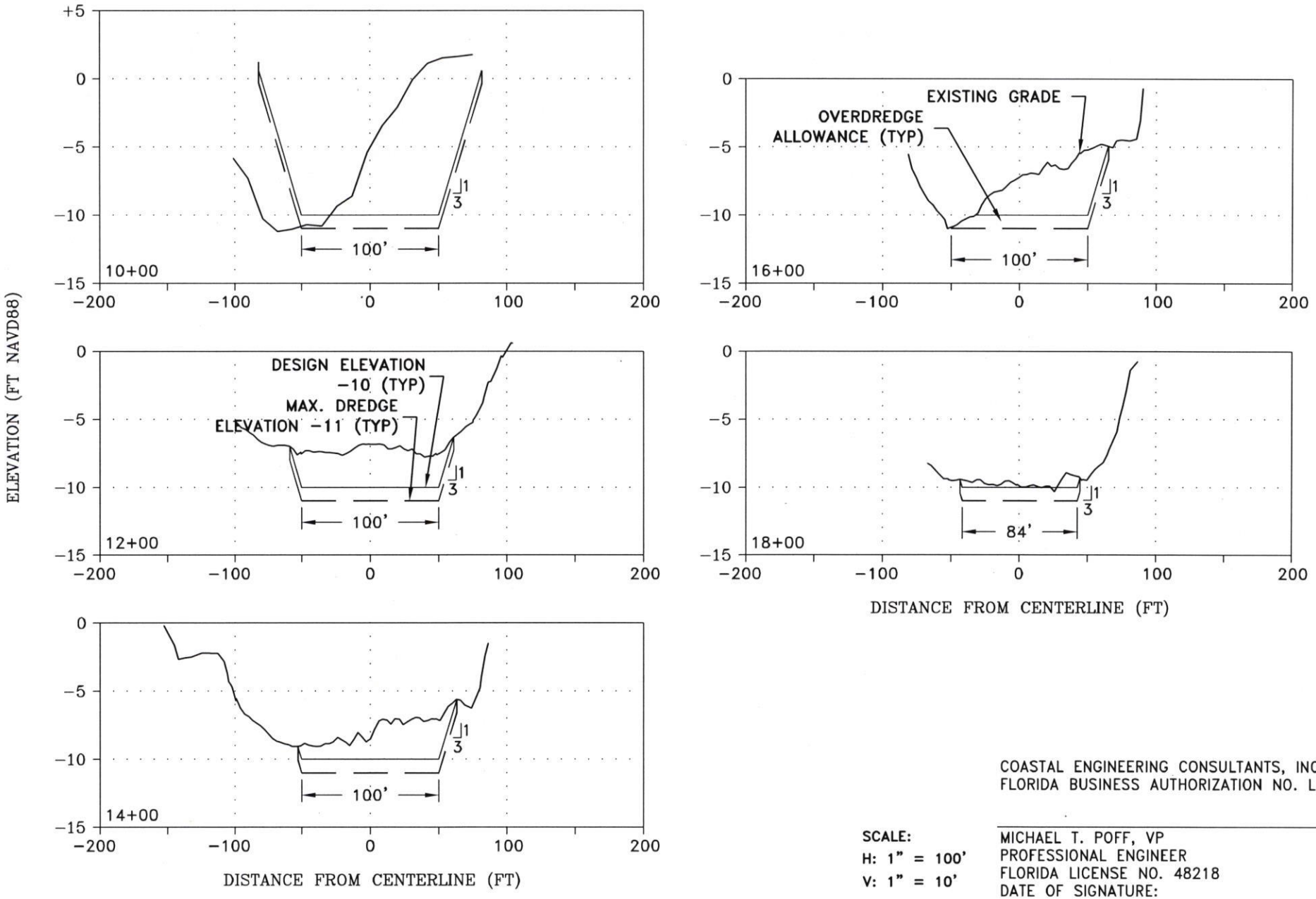
CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: CROSS SECTIONS 0+00 TO 8+00

DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 10058_P6.dwg			
REF. NO. 10.058			

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 6 OF
FILE NO.: 10058-P-6



COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

SCALE:
H: 1" = 100'
V: 1" = 10'

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

COASTAL ENGINEERING CONSULTANTS INC.
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3106 SOUTH HORSESHOE DRIVE
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FAX: (239)643-1143
www.coastalengineering.com
E-Mail: info@cecifl.com

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

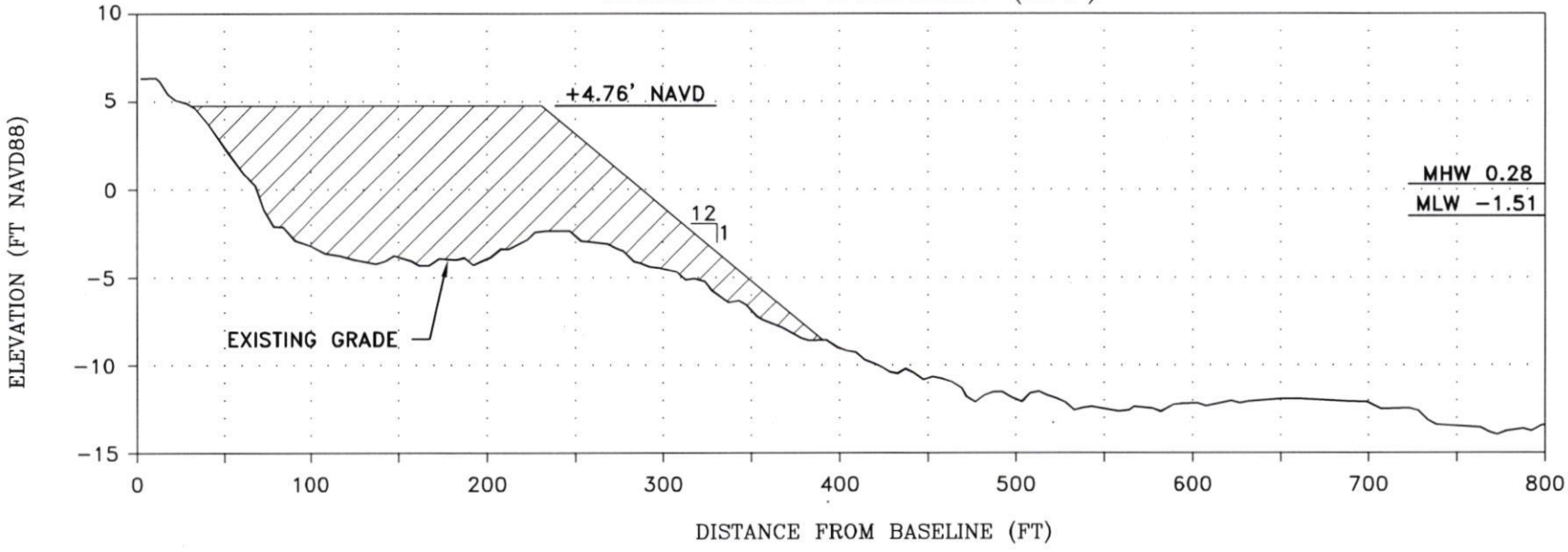
TITLE: CROSS SECTIONS 10+00 TO 18+00

DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 10058_P6.dwg			
REF. NO. 10.058			

NO.	DATE	BY	REVISION DESCRIPTION

FILE NO.: 10058-P-7 SHEET 7 OF

BEACH FILL TEMPLATE (TYP)



COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

MICHAEL T. POFF, VP
PROFESSIONAL ENGINEER
FLORIDA LICENSE NO. 48218
DATE OF SIGNATURE:

FILE NO.: 10058-P-8 SHEET 8 OF

COASTAL ENGINEERING CONSULTANTS INC.
A CECI GROUP COMPANY
Serving Florida Since 1977
3106 SOUTH HORSESHOE DRIVE
NAPLES, FLORIDA 34104

CIVIL ENGINEERING
SURVEY & MAPPING
COASTAL ENGINEERING
ENVIRONMENTAL
PLANNING SERVICES
PHONE: (239)643-2324
FAX: (239)643-1143
www.coastalengineering.com
E-Mail: info@cecifl.com

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BEACH FILL
TYPICAL CROSS SECTION

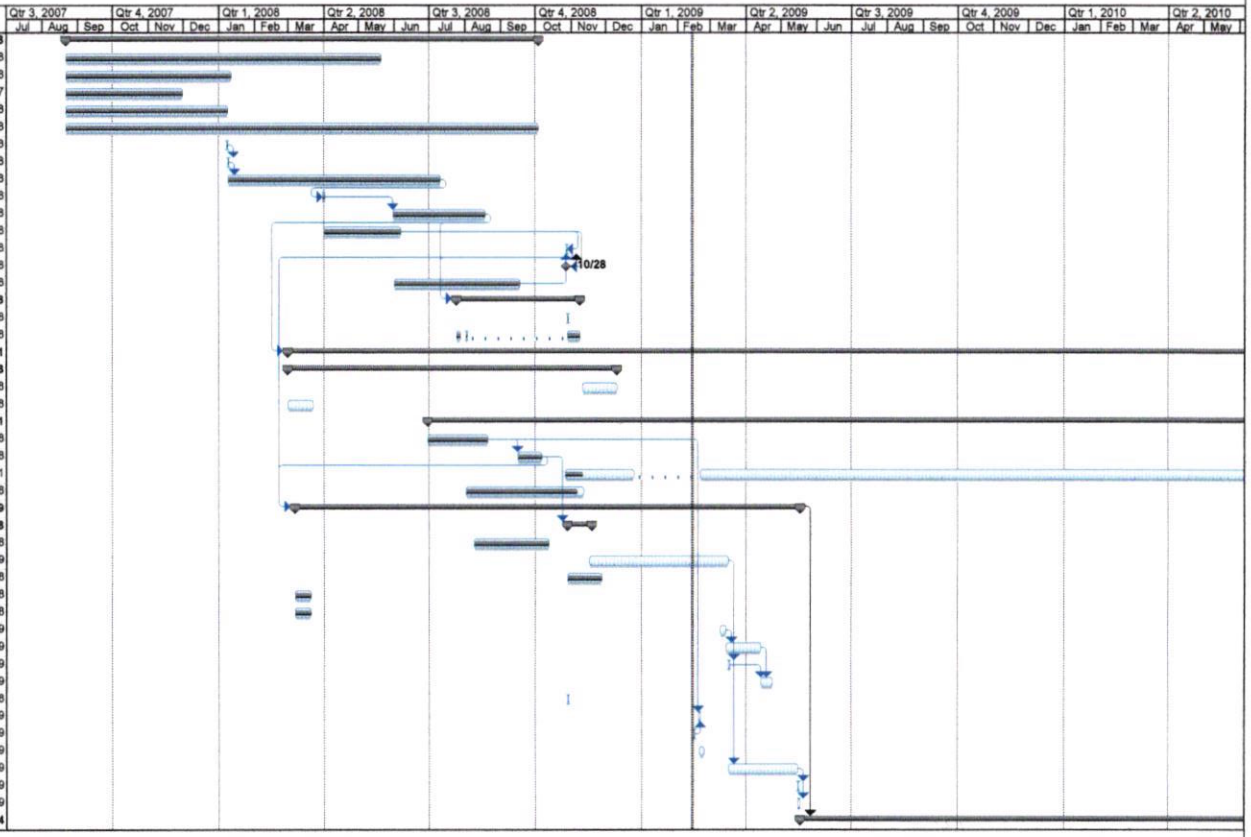
DATE: 8/10/10	SCALE: AS NOTED		
DRAWN: SDO	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 10058_P6.dwg			
REF. NO. 10.058			

NO.	DATE	BY	REVISION DESCRIPTION

Blind Pass Restoration
Project Schedule

Fri 2/13/09

ID	Task Name	Duration	Start	Finish
1	**Permitting**	**409 days**	**Wed 8/22/07**	**Fri 10/3/08**
2	Q24 Permit Sketches	273 days	Wed 8/22/07	Tue 5/20/08
3	Q28 QA/QC Plan	143 days	Wed 8/22/07	Fri 1/11/08
4	Q30 Shorebird Mgmt Plan	101 days	Wed 8/22/07	Fri 11/30/07
5	Q37 Biological Monitoring Plan	140 days	Wed 8/22/07	Tue 1/8/08
6	Q37 Physical Monitoring Plan	409 days	Wed 8/22/07	Fri 10/3/08
7	DEP Approval of Mitigation Plan	1 day	Tue 1/8/08	Tue 1/8/08
8	Transmittal of DEP mitigation Approval to USFWS	1 day	Wed 1/9/08	Wed 1/9/08
9	USFWS BO	184 days	Wed 1/9/08	Thu 7/10/08
10	DEP Notice of Completeness	2 days	Mon 3/31/08	Tue 4/1/08
11	ACOE permit	80 days	Sat 5/31/08	Mon 8/18/08
12	DEP final permit	67 days	Tue 4/1/08	Fri 6/6/08
13	DEP NTP	1 day	Tue 10/28/08	Tue 10/28/08
14	DEP SSL Lease	0 days	Tue 10/28/08	Tue 10/28/08
15	Plans, Specifications and Contract Documents	109 days	Sun 6/1/08	Wed 9/17/08
16	**Bidding**	**107 days**	**Fri 7/25/08**	**Sat 11/8/08**
17	Seagrass transplant contingency bid	1 day	Wed 10/29/08	Wed 10/29/08
18	Dredge Bid	16.1 days	Fri 7/25/08	Sat 11/8/08
19	**Pre-Con Monitoring**	**1065 days**	**Sat 3/1/08**	**Sat 1/29/11**
20	**Physical**	**285 days**	**Sat 3/1/08**	**Wed 12/10/08**
21	Pass/Shoal Surveys	30 days	Tue 11/11/08	Wed 12/10/08
22	Beach Profiles	22 days	Sat 3/1/08	Sat 3/22/08
23	**Biological**	**944 days**	**Mon 6/30/08**	**Sat 1/29/11**
24	Scar Aerials	52 days	Mon 6/30/08	Wed 8/20/08
25	Scar mapping	21 days	Tue 9/16/08	Mon 10/6/08
26	Bird monitoring	768 days	Mon 10/27/08	Sat 1/29/11
27	Secondary grass mapping	102 days	Sat 8/2/08	Tue 11/11/08
28	**Construction**	**437 days**	**Fri 3/7/08**	**Sun 5/17/09**
29	**Seagrass transplanting if required**	**21 days**	**Wed 10/29/08**	**Tue 11/18/08**
32	Turtle monitoring	65 days	Sat 8/9/08	Sun 10/12/08
33	Interior dredging	120 days	Mon 11/17/08	Mon 3/16/09
34	Captiva Drive A. Pine Removal	30 days	Wed 10/29/08	Thu 11/27/08
35	Captiva Drive terminus restoration	14 days	Fri 3/7/08	Thu 3/20/08
36	Captiva Drive barricade	14 days	Fri 3/7/08	Thu 3/20/08
37	Mangrove Planting Plan to DEP	5 days	Tue 3/10/09	Sat 3/14/09
38	Clam Bayou mangrove planting	30 days	Sun 3/15/09	Mon 4/13/09
39	Blind Pass mangrove planting	1 day	Tue 3/17/09	Tue 3/17/09
40	Mangrove Planting report to DEP	10 days	Tue 4/14/09	Thu 4/23/09
41	NMZ Management Plan to NWR	1 day	Wed 10/29/08	Wed 10/29/08
42	NMZ sign installation	2 days	Thu 2/19/09	Fri 2/20/09
43	MLETF NMZ training	1 day	Sun 2/15/09	Sun 2/15/09
44	PATON installation	4 days	Fri 2/20/09	Mon 2/23/09
45	Exterior dredging	60 days	Tue 3/17/09	Fri 5/15/09
46	Final Sheet Pile removal	1 day	Sat 5/16/09	Sat 5/16/09
47	Final till and grade	2 days	Sat 5/16/09	Sun 5/17/09
48	**Post Con Monitoring**	**1960 days**	**Mon 5/18/09**	**Sun 9/28/14**



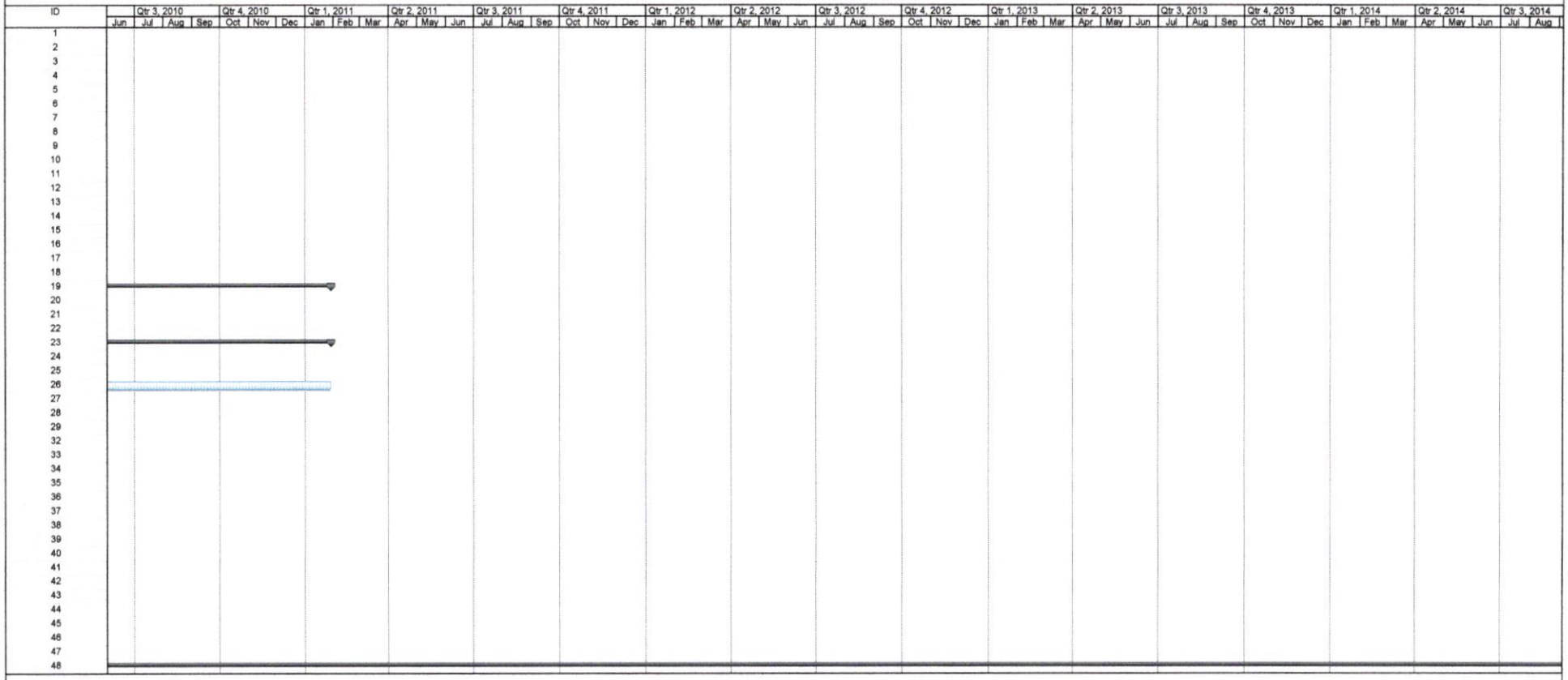
11/8/08 update

Project: BP_CEPD_schedule
Date: Fri 2/13/09

Task | Progress | Summary | Rolled Up Split | Rolled Up Progress | Project Summary | Deadline
Split | Milestone | Rolled Up Task | Rolled Up Milestone | External Tasks | External Milestone

Blind Pass Restoration
Project Schedule

Fri 2/13/09



Project: BP_CEPD_schedule
Date: Fri 2/13/09

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

Blind Pass Restoration
Project Schedule

Fri 2/13/09

ID	Qtr 4, 2014			Qtr 1, 2015			Qtr 2, 2015			Qtr 3, 2015			Qtr 4, 2015			Qtr 1, 2016			Qtr 2, 2016			Qtr 3, 2016			Qtr 4, 2016			Qtr 1, 2017			Qtr 2, 2017			Qtr 3, 2017			Qtr 4, 2017			Qtr 1, 2018			Qtr 2, 2018			Qtr 3, 2018			Qtr 4, 2018	
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
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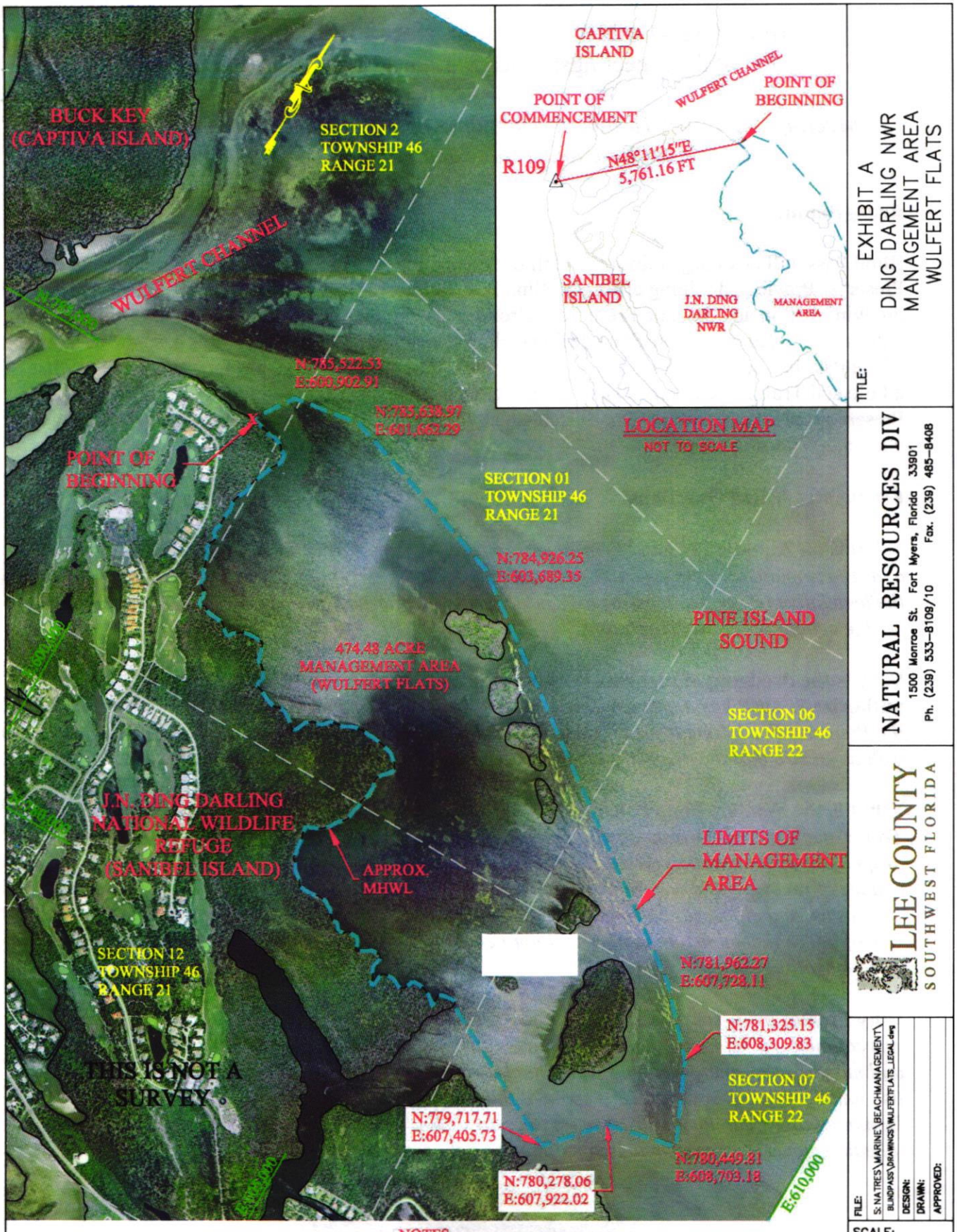
Project: BP_CEPD_schedule
Date: Fri 2/13/09

Task | Progress | Summary | Rolled Up Split | Rolled Up Progress | Project Summary | Deadline
Split | Milestone | Rolled Up Task | Rolled Up Milestone | External Tasks | External Milestone



NOTES

1. DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) PERMANENT REFERENCE MARKER R-109 SET IN CONCRETE ON THE NORTH WEST CORNER OF BLIND PASS BRIDGE, N:781,249.23; E:596,320.30.
2. COORDINATES REFERENCE FLORIDA STATE PLANE WEST, NORTH AMERICAN DATUM (NAD 83/90) FEET.

TITLE: EXHIBIT A
DING DARLING NWR
MANAGEMENT AREA
WULFERT FLATS

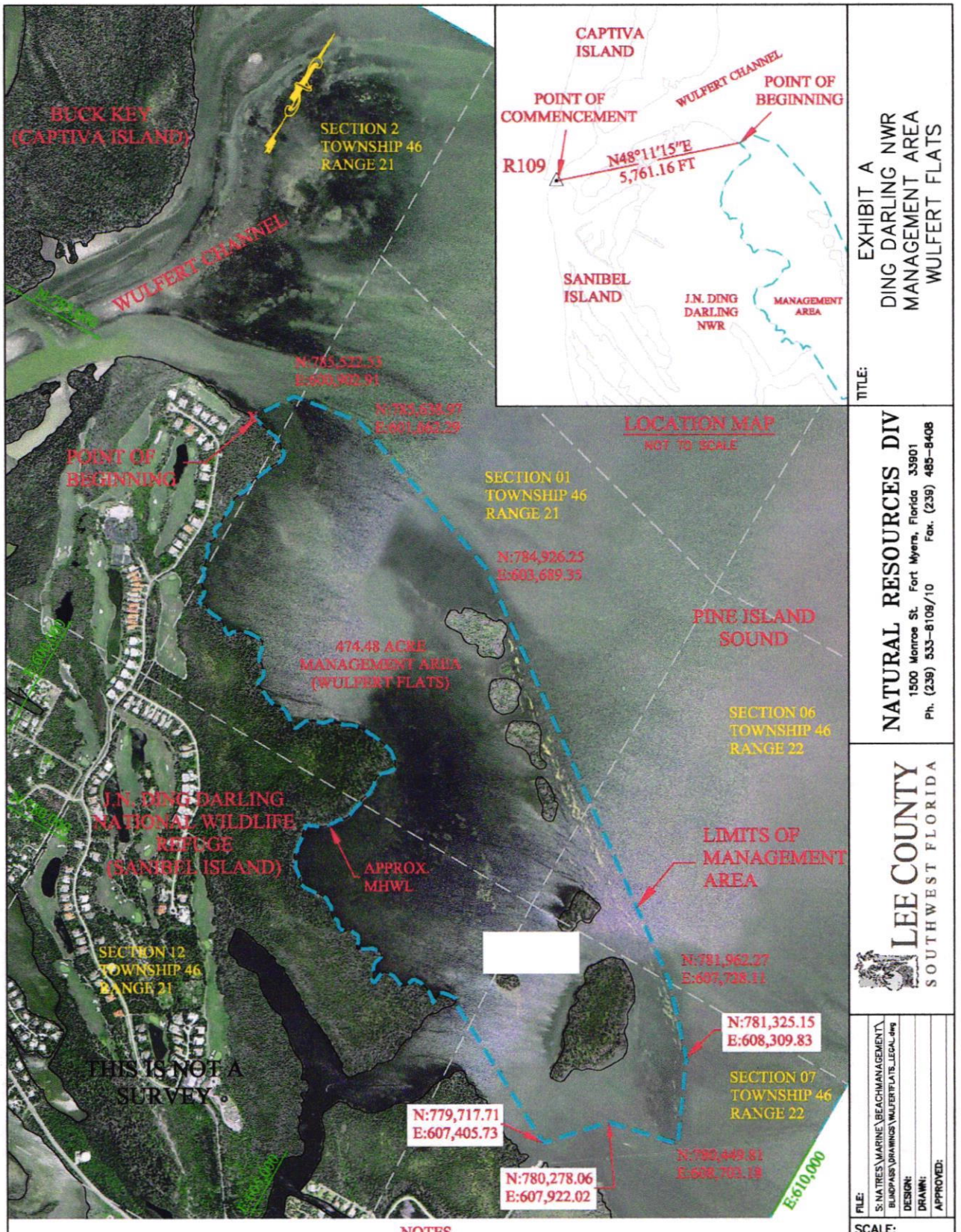
NATURAL RESOURCES DIV
1500 Monroe St. Fort Myers, Florida 33901
Ph. (239) 533-8109/10 Fax. (239) 485-8408

LEE COUNTY
SOUTHWEST FLORIDA

FILE: S:\NATRES\MARINE\BEACHMANAGEMENT\BLINDPASS\DRAWINGS\WULFERTFLATS_LEGAL.dwg
DESIGN:
DRAWN:
APPROVED:

SCALE: 1"=1500'

SHEET: 01 OF 01



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DESIGN:
DRAWN:
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SHEET: 01 OF 01

:e DEP Percentage, All Regions by Years

	State Spent	Local Spent
	66%	34%
	61%	39%
	49%	51%
	69%	31%
	86%	14%
	80%	20%
	39%	61%
	68%	32%
	47%	53%
	54%	46%
	46%	54%
AL		

FY Spent	State Spent	Local Spent	TOTAL
1992-1997	$38,757,453	$19,767,905	$58,525,358
1998-2002	$74,848,633	$70,340,339	$145,188,972
TOTAL	$113,606,086	$90,108,244	$203,714,330

FY Spent	State Spent	Local Spent
1992-1997	66%	34%
1998-2002	52%	48%
TOTAL		

2

	2100000200010	Bch	11/13/200	$3,983.02	$0.00	$3,983.02	$165.96	$3,817.06
	462100000240010	Bch	11/13/200	$3,370.58	$0.00	$3,370.58	$140.44	$3,230.14
	34621010000A0090	Bch	11/09/200	$337.93	$0.00	$337.93	$14.08	$323.85
	034621010000A011A	Bch	11/13/200	$256.32	$0.00	$256.32	$10.68	$245.64
	034621020000A011A	Bch	11/13/200	$4.80	$0.00	$4.80	$0.20	$4.60
	034621020000B0100	Bch	11/13/200	$158.40	$0.00	$158.40	$6.60	$151.80
07	034621020000B0110	Bch	11/13/200	$1,179.86	$0.00	$1,179.86	$49.16	$1,130.70
07	2245210000060130	Bch	11/05/200	$2,520.94	$0.00	$2,520.94	$105.04	$2,415.90
07	2245210100000030	Bch	11/13/200	$1,645.45	$0.00	$1,645.45	$68.56	$1,576.89
07	2245210200020000	Bch	11/05/200	$856.32	$0.00	$856.32	$35.68	$820.64
07	2245210200020050	Bch	11/02/200	$342.72	$0.00	$342.72	$14.28	$328.44
07	2245210200040060	Bch	11/09/200	$294.72	$0.00	$294.72	$12.28	$282.44
07	2245212300001610	Bch	11/05/200	$848.64	$0.00	$848.64	$35.36	$813.28
07	2245212300001613	Bch	11/06/200	$690.24	$0.00	$690.24	$28.76	$661.48
07	2245212300001629	Bch	11/09/200	$649.92	$0.00	$649.92	$27.08	$622.84
07	2245212300001632	Bch	11/01/200	$848.64	$0.00	$848.64	$35.36	$813.28
07	2245212300001636	Bch	11/15/200	$848.64	$0.00	$848.64	$35.36	$813.28
7	2245212300001638	Bch	11/05/200	$105.60	$0.00	$105.60	$4.40	$101.20
7	2245212300001647	Bch	11/13/200	$690.24	$0.00	$690.24	$28.76	$661.48
07	2245212600001257	Bch	11/15/200	$77.76	$0.00	$77.76	$3.24	$74.52
07	2645210000120000	Bch	11/05/200	$1,374.72	$0.00	$1,374.72	$57.28	$1,317.44
2007	2645210200030060	Bch	11/05/200	$1,840.32	$0.00	$1,840.32	$76.68	$1,763.64
2007	2645210200030220	Bch	11/05/200	$104.64	$0.00	$104.64	$4.36	$100.28
2007	2645210300580010	Bch	11/01/200	$135.36	$0.00	$135.36	$5.64	$129.72
2007	2645210300730010	Bch	11/08/200	$117.12	$0.00	$117.12	$4.88	$112.24
2007	2645212000000220	Bch	11/08/200	$592.32	$0.00	$592.32	$24.68	$567.64
2007	264521210000F0170	Bch	11/08/200	$1,410.24	$0.00	$1,410.24	$58.76	$1,351.48
2007	264521220000C0100	Bch	11/13/200	$564.49	$0.00	$564.49	$23.52	$540.97
2007	264521230000A1060	Bch	11/05/200	$313.92	$0.00	$313.92	$13.08	$300.84
2007	264521230000A1110	Bch	11/07/200	$313.92	$0.00	$313.92	$13.08	$300.84
2007	264521230000A1120	Bch	11/09/200	$438.72	$0.00	$438.72	$18.28	$420.44
2007	264521230000A2080	Bch	11/13/200	$478.08	$0.00	$478.08	$19.92	$458.16
2007	264521260000C1040	Bch	11/05/200	$402.24	$0.00	$402.24	$16.76	$385.48
2007	264521260000C2010	Bch	11/05/200	$404.16	$0.00	$404.16	$16.84	$387.32
2007	264521260000C3060	Bch	11/09/200	$394.56	$0.00	$394.56	$16.44	$378.12
2007	264521260000C3080	Bch	11/13/200	$460.80	$0.00	$460.80	$19.20	$441.60
2007	264521260000D2040	Bch	11/06/200	$324.96	$0.00	$324.96	$4.95	$320.01
2007	264521270000A1020	Bch	11/13/200	$179.52	$0.00	$179.52	$7.48	$172.04
2007	264521270000A2060	Bch	11/01/200	$180.48	$0.00	$180.48	$7.52	$172.96
2007	264521270000A2080	Bch	11/08/200	$179.52	$0.00	$179.52	$7.48	$172.04
2007	264521270000A3080	Bch	11/07/200	$226.56	$0.00	$226.56	$9.44	$217.12
2007	264521270000B4050	Bch	11/07/200	$179.52	$0.00	$179.52	$7.48	$172.04
2007	264521270000B5040	Bch	11/05/200	$449.28	$0.00	$449.28	$18.72	$430.56
2007	264521270000B5060	Bch	11/09/200	$180.48	$0.00	$180.48	$7.52	$172.96
2007	264521280000E3050 *	Bch	11/13/200	$526.08	$0.00	$526.08	$21.92	$504.16
2007	264521280000E3080	Bch	11/13/200	$532.80	$0.00	$532.80	$22.20	$510.60
2007	264521290000F1050	Bch	11/08/200	$414.72	$0.00	$414.72	$17.28	$397.44
2007	264521290000F2030	Bch	11/15/200	$321.60	$0.00	$321.60	$13.40	$308.20
2007	264521290000G3060	Bch	11/07/200	$511.68	$0.00	$511.68	$21.32	$490.36
2007	264521290000G3070	Bch	11/13/200	$511.68	$0.00	$511.68	$21.32	$490.36

Interlocal Agreement:

The first interlocal agreement for the Blind Pass Project was entered into in 2000 between the CEPD, City of Sanibel, and Lee County. The agreement calls upon CEPD to be a funding source for the project. While CEPD is not the project manager, approximately one third of the project cost will be funded by CEPD, in other words, with your tax dollars. Lee County and state funding will provide the balance of the funding. While CEPD is not managing the project, our goal is to dialog with Lee County and serve the community as a communication link.

History:

Since 1960 the pass has been open 23 years and closed 25 years

1960-1972 Pass Closed

1972-1977 Pass Open

1977-1982 Pass Closed

1982-2000 Pass Open

Since 2000 Pass Closed

Overview of Dredging:

Two dredges will operate 6 days a week during the daylight. No dredging on Christmas and New Years Day. The second dredge is likely to begin dredging today. Work to build the containment cell is a week away.

Dredging Depths
From the gulf area to sub area 4 is 10 feet deep
Sub area 4 to 5 depth is 9ft.
Sub area 5 back depth is 8 ft.

There is an over dredge allowance of 1 ft.

Starting at the gulf side dredging may be as wide as 330 ft., narrowing to 160 ft at the bridge. The channel width from sub 4 and beyond will be 100 feet.

All the material dredged from sub area 2 back is not suitable for placement and will be trucked away. upland

11513 Andy Rosse Lane Unit 4
472-2472

COASTAL ENGINEERING CONSULTANTS INC

File No. 08.043 Oct. 20, 2009
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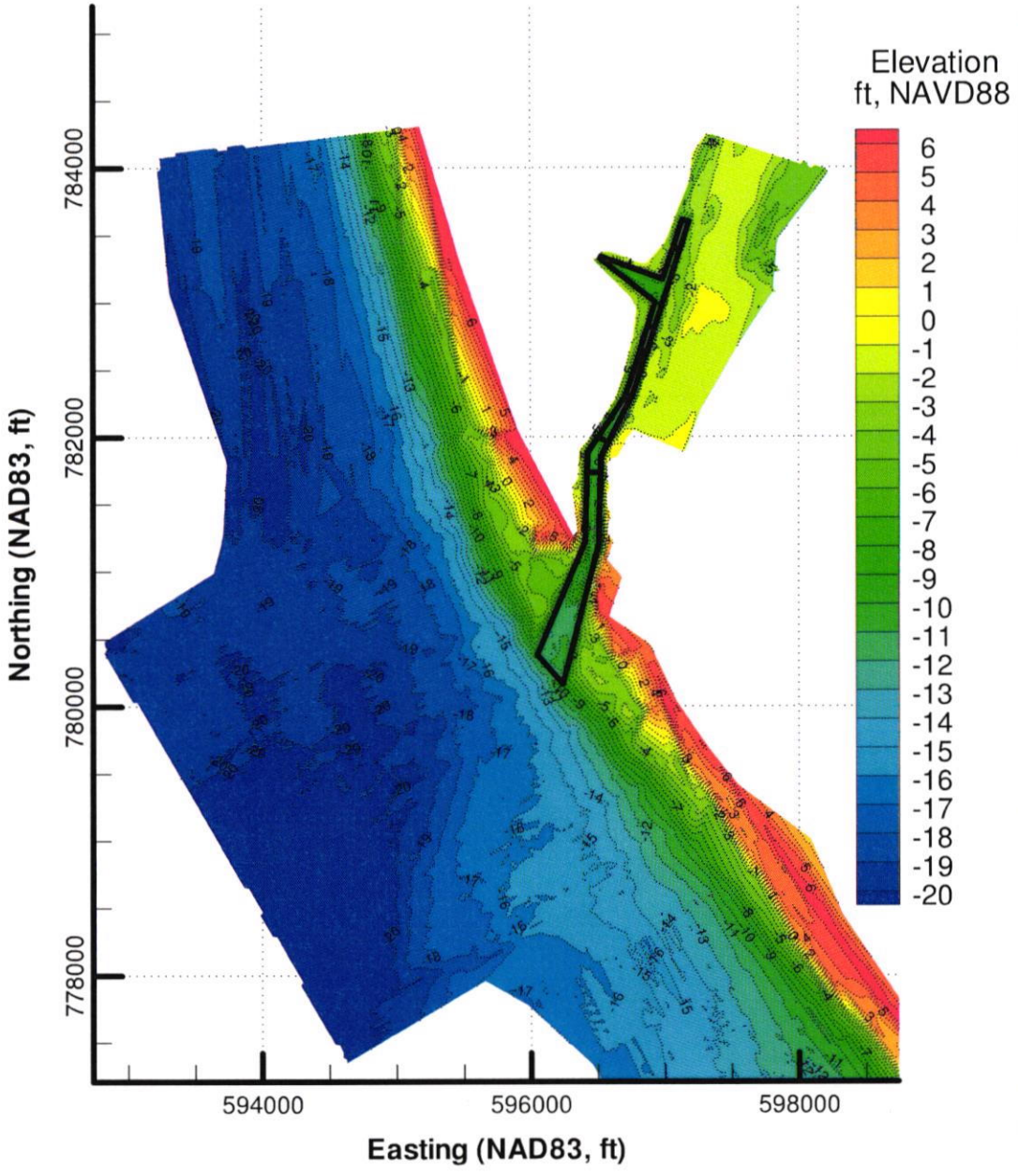
Blind Pass Contour Map: September 2009 Survey



COASTAL ENGINEERING CONSULTANTS INC

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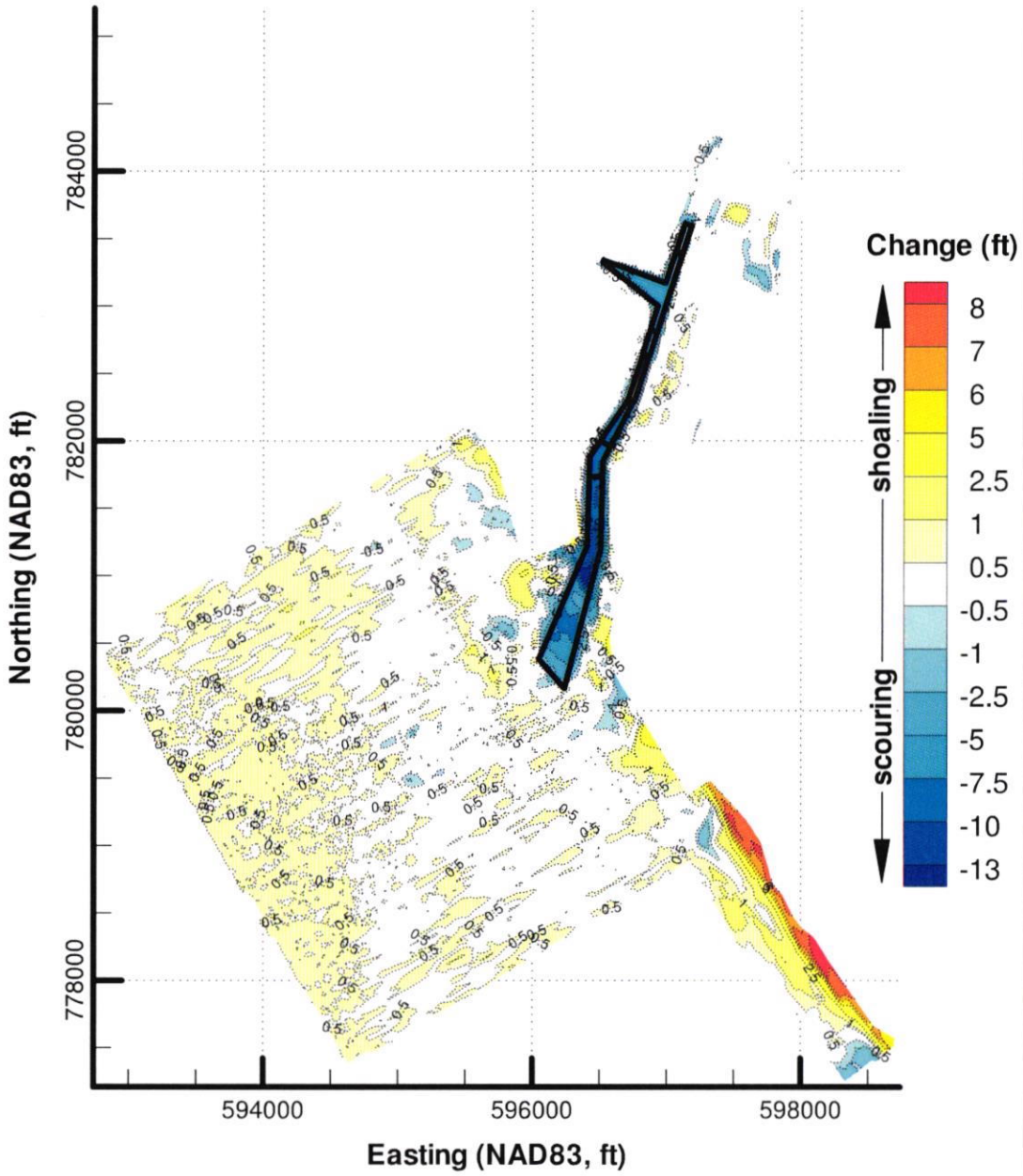
Blind Pass December 2008 - September 2009 Morphology Change



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Blind Pass Contour Map: Decemeber 2008 Survey