

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ADMINISTRATIVE HEARINGS**

MATLACHA CIVIC ASSOCIATION, INC.
J. MICHAEL HANNON,
KARL R. DEIGERT,
YOLANDA OLSEN,
ROBERT S. ZARRANZ,
DEBRA HALL, MELANIE HOFF,
and JESSICA BLANKS

DEP FILE No.: 244816-005
OGC Case Nos. 18-1443 - 1460

Petitioners,

v.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION,
and
CITY OF CAPE CORAL,

Respondents.

PETITION FOR ADMINISTRATIVE HEARING

Petitioners request an administrative hearing to challenge the Florida Department of Environmental Protection's ("FDEP") Notice of Intent to Issue an Environmental Resource Permit ("ERP") to the City of Cape Coral for removal of the Chiquita Boat Lock ("NOI"). The NOI was issued and signed on November 7, 2018, by Jon Iglehart, FDEP Director of District Management for the South Florida District.

INTRODUCTION

1. The Chiquita Boat Lock is a water detention barrier across the South Spreader Waterway in the City of Cape Coral. The purpose of the Chiquita Lock is to separate the canal waters of the southern end of the City from the navigable waters of the United States at the mouth of the Caloosahatchee River. The Chiquita Lock and the South Spreader Waterway were

constructed over 30 years ago by the early developers of Cape Coral (collectively identified as “GAC”) to remedy a Clean Water Act enforcement action brought in 1977 by the predecessor of FDEP, the Florida Department of Environmental Regulation (“DER”).

2. Consent Order No. 15 (April 19, 1977), which resolved the enforcement action, also required GAC to construct a North Spreader Waterway. The North Spreader Waterway, in turn, included another detention barrier known as the Ceitus Boat Lift Barrier.

3. This history is reported by consultants to the City, Avalon Engineering, in documents appended to the NOI. Avalon Engineering, at page 3 of its appended report, describes the goal of Consent Order No. 15: “to restrict destruction of the mangroves and to provide additional control and treatment of stormwater discharges” and “to be a freshwater system designed to retain and treat the stormwater runoff and then to provide uniform discharge of the stormwater into the adjacent mangroves.” FDEP and the City of Cape Coral do not dispute that Consent Order No. 15 requires these structures, including the Chiquita Lock and the Ceitus Boat Lift Barrier.

4. Despite the fact that Consent Order No. 15 remains in full force and effect today, the City of Cape Coral has applied for an ERP to remove the Chiquita Boat Lock. The City has offered only one reason for the request: to allow boaters navigate the Spreader Waterway without having to wait for operation of the Lock.

5. There is no environmental purpose whatsoever served by removal of the Chiquita Lock. On the contrary, its removal will cause significant environmental damage.

6. The State of Florida and the City of Cape Coral are also bound to maintain the Chiquita Boat Lock by the terms of a Warranty Deed of April 12, 1977, which was executed as a requirement of Consent Order No. 15. The Warranty Deed transferred mangrove wetlands

originally owned by GAC to the State of Florida in order that the North and South Spreader Waterways be maintained as designed and constructed by the original developer, GAC. The State of Florida, and hence its Department of Environmental Protection, is obligated under the Warranty Deed to maintain those lands in their natural state in an environmentally responsible manner.

PETITIONERS AND PARTIES AFFECTED

7. The agency which issued the NOI is the Florida Department of Environmental Protection, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, FILE No.: 244816-005. Director Jon Iglehart has been responsible for FDEP oversight in the City of Cape Coral for over thirty years.

8. The applicant for the permit is the City of Cape Coral, 1015 Cultural Park Boulevard, Cape Coral, Florida 33990.

9. Petitioners are the Matlacha Civic Association, Inc., a non-profit association for the residents of the island of Matlacha, Florida; Karl R. Deigert and J. Michael Hannon, residents of Matlacha; Melanie Hoff, a resident of St. James City, FL; and Cape Coral residents Yolanda Olsen, Jessica Blanks, Debra Hall, and Robert S. Zarranz, M.D. The additional information required by Rule 28-106.201(b), F.A.C., is contained in Exhibit 1, attached to this Petition.

PETITIONERS' SUBSTANTIAL INTERESTS

10. FDEP has issued its NOI for a permit to remove the Chiquita Boat Lock in accordance with Part IV of Chapter 373, Florida Statutes. In the NOI, FDEP acknowledges the potential adverse impact of the removal of the Chiquita Boat Lock:

The Department has determined that the proposed activity, because of its size, potential effect on the environment or the public, controversial nature, or location, is likely to have a heightened public concern or likelihood of request for administrative proceedings.

(NOI at 5). Section 373.016 (F.S.) declares the policy of the State, in relevant part, “to minimize degradation of water resources caused by the discharge of stormwater”; “to preserve natural resources, fish, and wildlife”; “to promote recreational development, protect public lands, and assist in maintaining the navigability of rivers and harbors”; and “otherwise to promote the health, safety, and general welfare of the people of this state.” In Section 403.021 (F.S.), the legislature also declares that: “The pollution of the air and waters of this state constitutes a menace to public health and welfare; creates public nuisances; is harmful to wildlife and fish and other aquatic life; and impairs domestic, agricultural, industrial, recreational, and other beneficial uses of air and water.”

11. Thus, the intended beneficiaries of Chapter 373 are the affected coastal aquatic ecosystems and members of the public who use and enjoy those ecosystems, live near those ecosystems, and/or depend on those ecosystems being healthy for their enjoyment and livelihoods, and the affected communities and members of those communities who are suffering health impacts as a result of the pollutants in the water and air.

12. All Petitioners will suffer injury in fact of sufficient immediacy to entitle them to a hearing, and Petitioners’ substantial injury is of a type and nature a hearing is intended to protect. Petitioners will suffer direct, immediate, and irreparable harm if the Chiquita Boat Lock is removed. The Chiquita Lock was originally constructed in the late 1970's as part of the Spreader Waterway System in mitigation of a Clean Water Act Section 404 violation. The Waterway System was designed to maintain natural flows of water which preexisted the canals. The removal of the Lock will alter the natural flow of water and allow direct flow of polluted canal waters into protected natural resource areas utilized by Petitioners, thus directly affecting their use and enjoyment of the water and natural resources of the area including Matlacha Pass

Aquatic Preserve. Petitioners allege that removal of the Chiquita Lock will have the effect of impairing, polluting, or otherwise injuring the air, water, or other natural resources of the state, including manatees and the habitat of the smalltooth sawfish.

13. In connection with the remediation of the Clean Water Act violations in the late 70s, the FDEP and the City of Cape Coral are obligated by a Warranty Deed to maintain the Spreader Waterways and the Chiquita Lock. Petitioners are direct beneficiaries of Consent Order No. 15 and the Warranty Deed, which Petitioners maintain prevents the removal of the Chiquita Boat Lock.

14. The Matlacha Civic Association is a Florida not-for-profit corporation, tax exempt as an IRS Section 501(c)(3) organization, located in Matlacha, Florida, in unincorporated Lee County. The principal purpose of the Association is to “Provide a unified voice on civic problems so that the best interests of Matlacha can be effectively presented to our County Commissioners, State Legislatures, other elected officials and the general public.” The Association has over 130 members on a tiny island with approximately 600 registered voters, almost all of whom live on canals. The waters surrounding Matlacha are impaired from nutrients emanating from the Cape Coral Spreader Waterways. If the Chiquita Lock is removed, the impairment of the waterways will increase, and the mangrove wetlands on the eastern edge of the Matlacha Estuary will die.

15. Karl R. Deigert is a resident of Matlacha, a certified boat Captain, operator of a motel located on the waters of the Matlacha Estuary, and conducts boat tours throughout the waterways of the Caloosahatchee, the estuaries, Charlotte Harbor, Pine Island Sound, and the Gulf of Mexico. Removal of the Chiquita Boat Lock threatens his use and enjoyment of those waters.

16. J. Michael Hannon is a resident of Matlacha, living on the waters of the Matlacha Estuary. He is a boater, fisherman, and kayaker enjoying the waterways which will be adversely affected by removal of the Chiquita Boat Lock.

17. Debra Hall's also states her substantial interest as follows: I moved to Southwest Cape Coral near the Chiquita Lock in September of this year. I also live on a canal approximately one mile due north of the Chiquita Lock. This Lock has successfully kept the cyanobacteria that is released from Lake Okeechobee into the Caloosahatchee River out of my canal. The environmental devastation seen in the Southeast Cape from the cyanobacteria migration due to Lake Okeechobee releases was not present in my canal due to this Lock. We had no green sludge. We saw no fish kills or dead manatees. Fish continuously thrived in the canal on which I live during the entire devastating event as a result of this Lock providing a barrier. We know that every person tested for microcystin in the City of Stuart, Florida, an airborne toxin that comes from cyanobacteria, tested positive due to the presence of cyanobacteria as a result of the Lake Okeechobee releases into the St. Lucie River. I have serious health issues. The risk to my health by the removal of the Chiquita Lock by the City of Cape Coral puts the City in a position of liability for any personal injury to me. Additionally, the property value of the home in which I live will be negatively affected, as will the property values of the homes in the entire Southwest Cape, should the Chiquita Lock be removed. The City will be liable for any devaluation of property due to contamination of the adjacent canals as a result of this willful, wanton, reckless and purposeful act of removal of the Chiquita Lock. The City of Cape Coral is hereby put on notice that they will be held legally liable for any ill effects to my health, and/or property devaluation of my home and the homes in my immediate vicinity should they remove the Chiquita Lock. The State of Florida and their Department of Environmental

Protection will be equally legally liable should they grant a permit to the City of Cape Coral for the removal of the Chiquita Lock. There have been no environmental impact studies done to assess the environmental risks posed by the removal of the Chiquita Lock and granting a permit to do so is ill-conceived and irresponsible.

18. Robert S. Zarranz, M.D., also states his substantial interest as follows: As a citizen of Florida and permanent resident in Cape Coral Florida, living on a canal, the actions of the DEP in allowing the removal of the lock will negatively impact my health, my family's health, property values and further endanger the ecosystem. As a physician, I am able to render expert opinion on the health impact.

19. Yolanda Olsen also states her substantial interest as follows: My home is on a dead-end canal adjacent to the south spreader canal and I travel by boat through the Chiquita Lock and fish in the south spreader canal on a frequent basis. I am a homeowner and have grandchildren and a puppy which is a water dog breed. If the lock is removed, Blue-green algae, cyanobacteria will bloom in the south spreader and adjacent canals. Cyanobacteria can be toxic to humans and pets. Exposure to the cyanobacteria neurotoxin BMAA may be an environmental cause of neurodegenerative diseases such as ALS, Parkinson's Disease and Alzheimer's Disease. Cyanobacteria is both water and airborne, so we will not be able to enjoy our outdoor spaces during 8 months of the year based on the 2018 bloom duration. Cyanobacteria can clog our boat engine intake and cause damage which requires repairs. Cyanobacteria can poison fish so we cannot eat the fish we catch, resulting in a higher grocery budget. Cyanobacteria in our canals will lower my property values, evidenced by reduced property values of canal homes plagued by blue green algae this season in Cape Coral Zip code 33904.

20. Jessica Blanks is a resident of Cape Coral and uses the waterways affected by the NOI. She is concerned that removal of the Chiquita Boat Lock will adversely affect her environment, the water, and cause further pollution and risk of bad health to her and others.

21. Melanie Hoff is a resident of St. James City on the south end of Pine Island and across from the mouth of the Caloosahatchee River. The removal of the lock will negatively impact the water quality of the surrounding areas resulting in loss of critical habitat for fish and wildlife and degraded conditions for recreational water activities. Her health and use and enjoyment of the water will be substantially affected by removal of the Chiquita Lock.

RECEIPT OF NOTICE

22. Petitioners received notice of the NOI when it was issued on November 7, 2018. The Department of Environmental Protection extended the time period in which to file this Petition to December 14, 2018.

STATEMENT OF ULTIMATE FACTS AND ARGUMENT AS TO HOW THE FACTS, RULES, STATUTES AND LAW REQUIRE REVERSAL OF THE DEPARTMENT'S NOTICE OF INTENT TO ISSUE PERMIT

A. The NOI Violates Consent Order No. 15 and the Obligations of the Warranty Deed of 1977.

23. In the mid-1970's, the Co-Trustees of Gulf American Corporation, GAC Properties Credit, Inc., and GAC Properties, Inc. (collectively referred to herein as "GAC") filed original permit applications, after work commenced, for a dredge and fill work project that created the canal system in Cape Coral with the FDEP's predecessor agency, the Department of Environmental Regulation ("DER"). Today, Cape Coral has over 400 miles of canals, the largest municipal canal system in the world.

24. In 1976, DER notified GAC that it intended to deny the permit applications because the project would result, in part, "in long term degradation of water quality of the coast

ecosystem"; "alter the existing watershed by eliminating the natural drainage pattern"; "accumulation of sediment, debris, nutrients, and toxic substances"; "creation of stagnant areas of water"; "interference with the conservation of fish, marine life, and wildlife, and other natural Resources"; and, "destruction of natural marine habitats, grass flats suitable as nursery or feeding grounds for marine life" DER also charged that "Major discharges at the beginning of the wet season or during a major storm will deliver a massive slug of pollutants directly into the coastal waters." Removal of the Chiquita Boat Lock will cause all of the same environmental hazards which first caused DER to take action against GAC in 1976.

25. Accordingly, in 1977, DER entered into Consent Order No. 15 with GAC to create the Spreader Waterway System and retention control systems, including locks and barriers, which allowed the development of the City of Cape Coral. The terms of Consent Order No. 15 resolved numerous violations of Chapters 253 and 403, Florida Statutes, and the Clean Water Act, Public Law 92-500. (Consent Order No. 15, April 19, 1977, attached as Exhibit 2).

26. In order to resolve these water violations, Consent Order No. 15 more specifically required GAC to construct a water retention system consisting of a "spreader waterway to serve as a water distribution system for intercepting and releasing discharges of waters from certain areas of the Cape Coral development" in order to "buffer, treat, and improve water quality before it reaches the Matlacha Pass [on the north] and the Caloosahatchee River [on the south]." (Consent Order No. 15 at 1, Exhibit 2).

27. In addition – due to water quality problems within the interior canal system and in order to prevent direct canal connections to the waters of the State – Consent Order 15 also required GAC to install three barriers and boat lifts, including what is now the Chiquita Lock,

along the spreader waterways to retain pollutants while providing for navigable access to Cape Coral canals.

28. This Spreader Waterway System was designed by Charles H. King, Jr., M., ASCE, and Gerald M. Ward, M.E. Their design was a ground-breaking step in the protection of mangrove environments. The engineering and environmental objectives of the Spreader Waterway System designed by Messrs. King and Ward were the following:

- (a) to negate the transportation and deposition of colloidal material on the shallow bay bottom flora and fauna in the Matlacha Estuary;
- (b) to keep the canal water table at a high level to prevent subsurface salt water intrusion;
- (c) to provide an environmentally acceptable manner of controlling nutrient laden runoff into the Matlacha Estuary in compliance with the newly enacted federal Clean Water Act;
- (d) to reestablish the predevelopment sheetflow of water through the mangrove and grasses to the west; and,
- (e) to assimilate the pollutants from the uplands in the spreader waterways and in the mangrove zones so that good quality water enters the Matlacha Estuary.

See, generally, King and Ward, “The Perimeter Canal: a New Approach to Discharge Urban Water Into a Coastal Mangrove Area,” at 99, Selected Papers. Sponsored by Irrigation and Drainage Division and Colorado Section, American Society of Civil Engineers,” (1973).

(Attached as Exhibit 3). More specifically, Messrs King and Ward wrote:

Matlacha Pass and Charlotte Harbor are shallow water ecosystems which would be significantly damaged if upland runoff was allowed to flow directly into the estuarine areas via excavated channels. The developer will combine urban development, recreation, and preservation of sensitive ecological areas through the use of the perimeter waterway.

This waterway will perform important environmental functions in collecting and allowing restricted, biologically screened discharge of the upland runoff. By collecting and restricting the upland runoff until deleterious components can be assimilated by natural vegetation, the perimeter waterway conceivably may improve water quality. The waterway will also act as a physical buffer between the developed and undeveloped areas in addition to being a

functioning part of the ecosystem. Through design the west edge of the waterway will maintain simulated sheet flow through the mangroves and grasses. Based on present observations, the mangroves will flourish in the nutrients and sediments deposited by the runoff, and the net productivity in the life chain cycle is expected to increase.

(*Id.* at 114-15, Exhibit 3). They described the Matlacha Estuary as “the most valuable marine habitat in the State.” (*Id.* at 108, Exhibit 3).

29. Consent Order No. 15 notably required GAC to relinquish to the State of Florida the mangrove wilderness lands it had purchased which lay west of the North and South Spreader Canals to the shores of the Matlacha Estuary. DER required GAC to divest the precious mangrove wetlands, “Because of the water quality benefits to be derived from the tidal wetlands surrounding Cape Coral and the treatment these natural areas provide for any indirect discharges from the Cape Coral area” (Consent Order No. 15 at 3, Exhibit 2).

30. Subsequently, GAC vested all its holdings and responsibilities in the City of Cape Coral. As a result, the City of Cape Coral and FDEP are now the responsible parties under Consent Order No. 15 and its amendments.

31. The State of Florida, and hence its Department of Environmental Protection, is obligated under the Warranty Deed to maintain those lands in their natural state:

At no time shall [the State of Florida] allow a use to be made of the premises which shall be inconsistent with preservation of same in accordance with acceptable principles of environmental conservation and shall retain the property’s natural character and quality.

(Warranty Deed, April 12, 1977, at 3, attached as Exhibit 4).

32. In furtherance of this goal, the Warranty Deed further provides as follows with respect to the Spreader Waterway:

Such waterway, in the collection of said runoff waters, is designed to allow for disposal of the excess waters so collected over and across the most westerly or southerly banks thereof onto the lands herein conveyed which lie waterward of

such water. The construction of all the foregoing waterway is authorized by the Department of Environmental Regulation and other regulatory agencies, *and the operation thereof in the collection and disposal of such waters requires that same be allowed to flow toward navigable waters and across the lands herein conveyed*
.....

(*Id.* at 3)(emphasis supplied).

33. The provisions of the Consent Order were included in the City's MS4 application for compliance with the NPDES requirements to reduce the generation of stormwater pollutants to waters of the state. The intent of Consent Order No. 15 and subsequent MS4 permits for Cape Coral was to isolate the stormwater runoff from Cape Coral for detention and treatment of pollutants in the Spreader Waterway System. Removal of the Chiquita Lock in the South Spreader will violate the NPDES provisions for the Cape Coral MS4 by conjoining these waters with waters of the United States without the isolation and treatment legally required. FDEP is currently reviewing the Lee County MS4 permit renewal application that includes Cape Coral as a co-permittee. This NPDES permit cannot be reissued without reasonable assurance that discharges from the MS4 system will not cause or contribute to the impairment of a downstream waterbody. In this case the downstream waterbody is the Caloosahatchee Estuary that is impaired for nutrients (total nitrogen).

34. Consent Order No. 15 is a contract. A Consent Order once issued is binding on the parties in future disputes under the legal doctrine of *res judicata*. *Coral Reef Nurseries, Inc. v. Babcock Co.*, 410 So.2d 648 (Fla. 3rd DCA, 1982). Similarly, a Warranty Deed is enforceable among the parties as well as by persons whose interests are protected by the terms of the Warranty Deed. *White v. Metropolitan Dade County*, 563 S.2d 117 (Fla. 3rd DCA, 1990). There is no doubt that the NOI violates both precedents as a matter of law.

B. Removal of the Chiquita Boat Lock will Increase the Level of Pollutants Delivered into the Waters of the United States and Violates the Existing MS 4 Permit.

35. The litany of “reasonable assurances” in the NOI are unsupported by fact.

However, there is an existing model demonstrating without doubt that removal of the Chiquita Lock will increase pollutants delivered to the Caloosahatchee. In 2008 the City of Cape Coral removed the Ceitus Boat Lift Barrier on the North Spreader Waterway. As a comparative example, nitrogen concentrations in the North Spreader Waterway (the Cape Coral MS4 discharge) have exhibited an increasing trend since removal of the Ceitus Boat Lift Barrier in 2008. As a result, the EPA has declared the Matlacha Pass Aquatic Preserve impaired, adding it to the section 303(d) list in August of 2015.

36. The result of removing the Chiquita Lock will have a similar effect on the Caloosahatchee Estuary as compared to removal of the Ceitus Boat Lift Barrier. In this case, the Caloosahatchee Estuary is already verified impaired with a TMDL for TN. Removing the Chiquita Lock will eliminate the intended MS4 detention and treatment function of 797 acres (estimated at 3000 – 5000 acre feet) of the South Spreader system from the MS4 treatment area. As described by the applicant in response to the FDEP RAI, removing the lock will allow tidal influence and exchange to overwhelm or substantially change the hydraulic dynamics of the South Spreader treatment area. In effect, removing the lock will reduce the intended hydraulic functioning of the system. The intended function of the South Spreader System can only be maintained by isolating the treatment area and increasing the hydraulic residency time with the lock in place, currently required as part of the MS4 permit. This system can no longer be considered as a treatment area without the lock in place resulting in the necessary hydraulic

residence time or detention needed to effectively sequester nitrogen and other pollutants from Cape Coral's stormwater runoff.

37. Removing such an extensive volume of water from the current NPDES stormwater active treatment system eliminates reasonable assurance that the NPDES system will not contribute pollutants to a downstream waterbody already impaired for nutrient pollution. Furthermore, removing the Chiquita Lock will reduce the function of the treatment system related to its water level enabling redistribution of Cape Coral stormwater from the spreader canals into the mangrove fringe before impacting waters of the state. All of these outcomes also violate the terms of Consent Order No. 15.

38. A review of nitrogen concentrations occurring within the South Spreader treatment area indicates that nitrogen concentrations are not declining but continuing to trend upward. Chlorophyll a and BOD concentrations, apparently in response to the upward trend in TN concentration, are also trending up at the same location within the South Spreader predominantly confined for treatment as intended and required by the Chiquita Lock. Similar upward TN trends are evident in the Caloosahatchee Estuary despite implementing the load reduction requirements (23% reduction in TN loading per TMDL 62-304.800(2), F.A.C.) of the associated TMDL (2009) and BMAP begun in 2012. The increasing trend of TN concentration in the estuary emphasizes the need to reduce discharges and loading from watershed sources including Cape Coral.

39. As derived from Tidal Caloosahatchee BMAP Annual Progress Reports, Cape Coral has only averaged 651 lbs. TN load reduction per year for 2013 – 2015 with 53,977 lbs. of annual load reduction remaining to achieve the BMAP TN load allocation for Cape Coral. At

the current rate of TN load reduction, it would take Cape Coral 83 years to achieve the BMAP TN load reduction target assuming no additional loading during the 83 year period.

40. In regard to the continuing discharge of sediment from the Spreader Waterway System, one must note that the NOI is not the product of any legal review by either the FDEP or the City of Cape Coral. A prudent legal review would disclose that discharge of sediment – which is occurring regularly now that the Ceitus Barrier has been removed – is a violation of the Clean Water Act. This form of sediment – which has overwhelmed the seagrass beds of Matlacha Estuary adjacent to the North Spreader Waterway – stays intact over time and thus continues to have roughly the same net polluting effect years or even decades after the time of their deposit. This condition is an ongoing violation of the Clean Water Act. *See, e.g., Sasser v. Administrator, U.S. E.P.A.*, 990 F.2d 127, 129 (4th Cir.1993); *Informed Citizens United, Inc. v. USX Corp.*, 36 F.Supp.2d 375, 377 (S.D.Tex.1999); *United States v. Reaves*, 923 F.Supp. 1530, 1534 (M.D.Fla.1996).

41. Violations are deemed “continuing” when the violator (1) illegally dumps fill material in wetlands or other federal waters; and (2) is in a position to remove the pollutants but fails to do so. *See, e.g., Sasser v. Administrator, U.S. E.P.A.*, 990 F.2d at 129; *Informed Citizens United, Inc. v. USX Corp.*, 36 F.Supp.2d at 377-78 (holding the “in violation” requirement satisfied by the continued presence of fill in wetlands); *United States v. Reaves*, 923 F.Supp. at 1534 (“Defendant's unpermitted discharge of dredged or fill materials into wetlands on the site is a continuing violation for as long as the fill remains.”); *United States v. Cumberland Farms*, 647 F.Supp. 1166, 1183-84 (D.Mass.1986), *aff'd* 826 F.2d 1151 (1st Cir.1987) (holding that the defendant violated the CWA not only for each day that it used a bulldozer or backhoe in the wetlands but for each day that it allowed the illegal fill material to remain there); *Ctr. for*

Biological Diversity v. Marina Point Dev. Associates, 434 F. Supp. 2d 789, 798 (C.D. Cal. 2006).

C. The City of Cape Coral Fails to Establish that Removal of the Chiquita Lock is in the Public Interest.

42. Whether a proposed activity is in the public interest is governed by Section 373.414 (F.S.) which provides in pertinent part as follows:

(a) In determining whether an activity, which is in, on, or over surface waters or wetlands, as delineated in s.373.421(1), and is regulated under this part, is not contrary to the public interest or is clearly in the public interest, the governing board or the department *shall consider and balance* the following criteria:

1. Whether the activity will adversely affect the public health, safety, or welfare or the property of others;
2. Whether the activity will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
3. Whether the activity will adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
4. Whether the activity will adversely affect the fishing or recreational values or marine productivity in the vicinity of the activity;
5. Whether the activity will be of a temporary or permanent nature;
6. Whether the activity will adversely affect or will enhance significant historical and archaeological resources under the provisions of s. 267.061; and
7. The current condition and relative value of functions being performed by areas affected by the proposed activity.

(Emphasis supplied).

43. The burden to demonstrate entitlement to an ERP permit is on the applicant, the City of Cape Coral. The Avalon Engineering Report that accompanies the NOI says removal of the Chiquita Boat Lock is necessary “to resolve a public safety issue due to increased boat traffic utilizing the Spreader Waterway.” (Avalon Engineering Report at 1). Although the United

States Coast Guard monitors boater accidents in the tidal waters of the United States, Cape Coral has cited no evidence of any boating accidents at the Chiquita Boat Lock. This is so even though the terms of the FDEP Permit allowing the Lock to remain open on incoming tides required monitoring of boat safety.

44. Nor is there any indication of the magnitude of boater use of the Chiquita Boat Lock. In 2003, Cape Coral commissioned the design of a dual high speed lock for the Chiquita Boat Lock. In the report on the dual boat lock, it was stated that in 2001-2002, boater transport at the Chiquita Lock averaged 200 passages a month, or less than 7 a day. The report noted 30-45 minute waits on weekends. However, the report noted that the dual lock would have increased boat passage by 250% over the existing lock. The report also recommended that both the dual lock and the single lock remain in place to accommodate maintenance. No similar data has been produced for the current time period.

45. Nor has Cape Coral produced any data as to how many boat owners are located adjacent to the South Spreader Waterway. In contrast, Cape Coral in 2015 operated 5 boat launch ramps. During that year, there were a total of 15,042 paid boat launches among all five ramps. By far the majority occurred in the waters served by the North Spreader Waterway. Cape Coral has not explored creation of additional boat launching facilities south of the Chiquita Boat Lock, nor has it offered any information as to whether the boat launching facilities on the Caloosahatchee are overwhelmed with boaters.

46. More particularly, the NOI and the Avalon Engineering Report say nothing about installation of a high speed dual lock as an alternative to creating an open system that admittedly will further pollute the Estuary.

47. The NOI also does not take into account the adverse impact of falling canal levels. In the last year, during low canal levels, seawalls of Cape Coral residents have fallen into the canals. Cape Coral has required these residents to rebuild their seawalls at an average expense of \$30,000. In addition, Cape Coral has entered into a million dollar contract with a northern neighbor to release millions of gallons of fresh water south into the Cape Coral canals. While the folly of this purchase is self-evident from the fact that these waters simply flow out the open North Spreader canal, the purchase would be entirely unnecessary with both the Chiquita Lock and Ceitus Boat Lift Barrier in place. Waters would be retained during the dry season. Moreover, the NOI takes no account of the impact of falling canal levels on the very boaters it intends to benefit. Boats of even average draft will not be able to negotiate canals with depths of 2-3 feet. The larger boats which dock in Cape Harbour Marina will be left sitting on their expensive props.

48. Therefore, there was no actual balancing of the seven criteria set forth in Section 373.414(a) (F.S.). FDEP admits in the NOI that removal of the Chiquita Boat Lock will have an adverse impact on the wetlands and the waters of the United States. Rather than weighing that impact against calming the nerves of an unknown number of weekend boaters, the FDEP says Cape Coral has engaged in several other projects which improve the environment. (NOI at 2). The problem with this observation is two-fold: (1) federal law requires proof that an activity adversely affecting federal waters is “unavoidable” before a permittee can be given credit for mitigation measures; and, (2) the mitigation measures offered by Cape Coral have no impact on ameliorating the adverse impact of removing the Chiquita Boat Lock. (*See* Memorandum of Agreement at 1, U.S. Dept. of the Army and EPA, December 13, 2017, attached as Exhibit 5).

49. In conducting the balancing test required by Section 373.414(a) (F.S.), DOAH also must take into consideration the behavior of FDEP and the City of Cape Coral since the turn of the century. Quite simply, both have Unclean Hands, as they have not acted as good stewards of the waterways.

STATEMENT OF DISPUTED ISSUES OF MATERIAL FACT

50. Removal of the Chiquita Lock will result in increased delivery of pollutants into the waters of the United States and damage to the mangrove wetlands.

51. Cape Coral has not met the load reduction requirements of the BMAP.

52. The load reduction requirements of the BMAP utilized by FL DEP are antiquated and do not represent current nitrogen loading. The compensatory mitigation proposed by Cape Coral, to meet the no net increase in TN, was based largely on estimates of loading in the Caloosahatchee Estuary BMAP. These BMAP loading and subsequent load reduction targets were based on loading from 2004/2005 land use. It is unknown how much additional loading has occurred since 2004 or what the current loading is which would make a net change estimate from the proposed mitigation arbitrary.

53. Cape Coral erred in applying fresh water criteria to determine nitrogen load of the Spreader Canal.

54. Cape Coral erred in determining that uplands contributing runoff to the Spreader Canal have reached their maximum build out. Further build out will increase nutrient laden runoff into the Spreader Canal.

55. FDEP and Cape Coral are bound to comply with Consent Order No. 15 which prohibits removal of the Chiquita Lock. FDEP may not “amend” Consent Order No. 15 through

the issuance of a permit allowing FDEP and Cape Coral to evade the requirements of Consent Order No. 15.

56. FDEP is bound by Consent Order No. 15 to maintain the west berm of the Spreader Waterway and the Chiquita Lock.

57. FDEP is bound by the Warranty Deed of 1977 to maintain the west berm of the Spreader Canals and the Chiquita Lock.

58. Director Iglehart erred in the following:

a. Giving Cape Coral load reduction credits for its alleged environmental improvements. Those projects do not prove any environmental benefit to the affected wetlands and waters of the United States adversely affected by removal of the Chiquita Lock.

b. Not requiring Cape Coral to conduct a nutrient budget study to ascertain the adverse impacts of removal of the Chiquita Lock

c. By granting 70,000 lbs of TN/yr reduction as a result of septic to sewer conversion. There is no data quantifying TN pollution from septic tanks. In addition, treated wastewater displacing septic would still deliver TN to the canal system and overall nutrient budget.

d. Awarding about 27K lbs. TN/yr reduction for using treated wastewater for lawn irrigation. There is no data supporting this assumption, and assumes too much sequestration of TN based on existing soil characteristics.

e. Giving Cape Coral credit for nitrogen load reduction for the Spreader Canals and freshwater canals. Those canals do not act as a “sink” for nitrogen assimilation; rather, they are a source of nitrogen flowing into waters of the United States. FDEP has granted about 28,000 lbs of TN/yr reduction credit from the detention sequestering of the freshwater canal system that

flows into the South Spreader upstream of the lock. The freshwater canals are more likely a source instead of a sink due to their age of over 50 years and accumulated TN as a legacy component. Also, the canals were not designed as a modern wet detention basin on which TN sequestering estimates are based but were designed mostly to convey water off the landscape as flood control with highly variable hydraulic residence times. One estimate is that a wet detention basin needs a minimum of 14 days residency to effect the assumed sequestering.

f. Not recognizing that increased flow from removing the Chiquita Lock would depress salinity in the downstream area that is also a sawfish exclusion zone.

g. Failing to ascertain the level of sediment and pollutant dispersal into the Matlacha Estuary from removal of the Chiquita Lock, despite ample evidence of the devastating and continuing deliver of pollutants into the Estuary when the Chiquita Boat Lift Barrier was removed in 2008.

h. Concluding there would be no adverse effect on manatees, ignoring the ACOE Public Notice which states: *“The Corps has determined the proposed project may affect, likely to adversely affect the West Indian manatee (Trichechus manatus).”*

i. Failing to recognize that removing the Chiquita Lock would violate Cape Coral’s MS4 permit. Removal of the lock creates an open and tidally influenced basin. This basin would represent the loss of about 800 acres of brackish treatment area within the existing MS4 jurisdiction and the entire South Spreader basin.

j. Failing to consider alternatives to removal of the Chiquita Lock to achieve the goal of boater safety. First, had FDEP and Cape Coral conducted regular maintenance of the Spreader Waterways, none of the so-called “breaches” on the western berm would currently exist. This maintenance is required by both Consent Order No. 15 and the Warranty Deed of

1977. Second, in 2002, Cape Coral engaged engineers to prepare plans for a dual boat lock system which should have been installed at both the Ceitus Barrier site and the Chiquita Lock site.

k. Failing to account for the fact that algae and aquatic vegetation mask total nutrient loading figures.

l. Concluding that the waters upland of the Chiquita Lock and those below the lock have similar characteristics regarding nutrient levels.

m. Concluding that Cape Coral's proposal complies with Section 401 of the Clean Water Act.

n. Concluding that Cape Coral's proposal is consistent with the Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456.

o. Concluding that Cape Coral's proposal conforms with State and federal environmental laws because he did not consider any evidence outside the FDEP file.

59. The removal of the Chiquita Lock will require dredging of the Spreader Waterway in order to maintain safe passage of vessels. No permit for such dredging is included in the NOI.

RULES AND STATUTES WHICH REQUIRE DENIAL OF THE NOI

60. Florida Statutes 373.016.

61. Florida Statutes 373.414.

62. Title 16 U.S.C. Section 1456.

63. Title 16 U.S.C. Sections 1531, *et seq.*

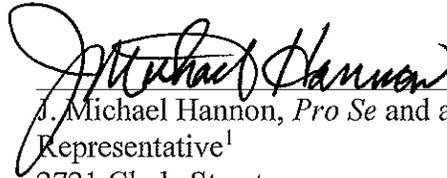
64. Title 33 U.S.C. Section 1311.

- 65. Title 33 U.S.C. Section 1313.
- 66. Title 33 U.S.C. Section 1341.
- 67. Title 33 U.S.C. Section 1342.
- 68. Title 33 U.S.C. Section 1344.
- 69. Title 40 C.F.R. Section 130.7
- 70. 50 C.F.R. Section 17.108.
- 71. 50 C.F.R. Section 226.218.

RELIEF SOUGHT

Petitioners request that the NOI be denied.

Respectfully submitted,



J. Michael Hannon, *Pro Se* and as Qualified
Representative¹
2721 Clyde Street
Matlacha, Florida 33993
jmikehannon@gmail.com
(202) 365-5561

¹ Pursuant to Rule 28-106.105(a). Petitioners also have filed a Request for Qualified Representative under Rule 28-106(2)(a) along with this Petition.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing was sent via electronic transmission to the following this 14th day of December, 2018:

Craig Vam, Esq.,
Manson, Bolves, Donaldson, and Varn
106 East College Ave.
Suite 820
Tallahassee, FL 32301
cvam@mansonbolves.com

Matlacha Civic Association, Inc.,
By Karl R. Deigert, President
Box 121
Matlacha, Florida 33993
(239) 898-2044
karldeigert@outlook.com

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Debra Hall
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Yolanda Olsen
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olsen.yolanda@gmail.com
239-471-7592
239-240-7015

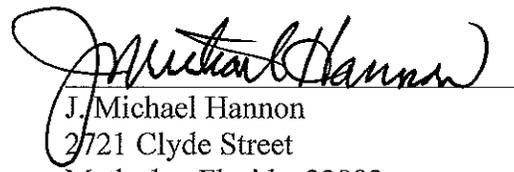

J. Michael Hannon
2721 Clyde Street
Matlacha, Florida 33993
(202) 365-5561
jmikehannon@gmail.com

EXHIBIT 1

PETITIONERS

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239-240-7015

EXHIBIT 2

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

DEPARTMENT OF ENVIRONMENTAL)
REGULATION,)
vs.) Order No. 15
GAC PROPERTIES, INC.,)
Lee County.)
_____)

CONSENT ORDER

This is a Consent Order between the State of Florida Department of Environmental Regulation (hereinafter referred to as the "Department") and Frank J. Callahan and Herbert S. Freehling, as Co-Trustees of GAC Corporation, GAC Properties Credit, Inc., and GAC Properties, Inc. (hereinafter referred to as "GAC").

Background: Permit applications were filed with the Department for certain dredge and fill work to be done at the Cape Coral Project of GAC. The Department issued a letter dated June 30, 1976 informing GAC of the Department's intent to deny certain of these permits. In addition, the Department issued Warning Notice No. 7996 dated July 9, 1976 regarding ongoing dredge and fill activities within the Cape Coral Project. On August 26, 1976, the Department set out by letter the modifications of the Cape Coral Project required to allow the completion of the project. Subsequently, the GAC verbally agreed to incorporate and implement the proposed, major modifications, subject to the approval of the Bankruptcy Court. It was also determined after the initial denial that GAC qualified for special consideration. This order represents the best efforts of the Department and GAC to improve an old project, begun prior to this decade. It does not signify water quality standards will be met in the interior canals, but is an attempt to buffer, treat, and improve water quality before it reaches Matlacha Pass or the Caloosahatchee River. This Consent Order resolves the alleged violations and serves as the authorization from the Department to complete the work.

1. GAC agrees that no development work shall be done waterward of the line identified as "A" drawn on Exhibit No. 1. Any work that has been done by GAC waterward of this line shall be restored. Restoration shall include the removal or replacement of all GAC-excavated fill material to natural elevation in the areas designated as "B" on Exhibit No. 1. Restoration shall commence within sixty (60) days of the date of entry of this Consent Order, continue in a continuous manner, and be completed to the satisfaction of the Department's district office within one (1) year of the date of entry of this Consent Order.

2. All work landward of "A" on Exhibit No. 1 will be done as described in Exhibit No. 2. The Department originally indicated its intent to deny the applications for permits because of its concern over water quality in the canal system and discharges from the canal system. GAC agrees to construct a pollution retention system landward of "A" on Exhibit No. 1. This retention system will consist of a perimeter spreader waterway to serve as a water distribution system for intercepting and releasing discharges of waters from certain areas of the Cape Coral development. GAC agrees to construct back-to-front sloping lots, swales and weirs within the inland portion of the undeveloped portion of Cape Coral, so as to retain as much of the runoff from the upland as possible, as well as increase the retention and percolation of freshwater to the aquifer. GAC shall prepare a hydraulic assessment to determine the maximum retention of runoff possible within the swales and canals. All work described in this paragraph of the Consent Order shall be performed as described in Exhibit No. 2.

3. Because of the water quality problems within the interior canal system, the Department cannot allow any direct

connection of Cape Coral waterways to waters of the State, which direct connections do not presently exist. Therefore, GAC shall install boat lifts to provide navigable access to Cape Coral canals which do not presently have access to waters of the state. The locations of the boat lifts are identified on Exhibit No. 1 as C₁, C₂ and C₃. Construction of the boat lifts shall be as described in Exhibit No. 2.

4. Because of the water quality benefits to be derived from the tidal wetlands surrounding Cape Coral and the treatment these natural areas provide for any indirect discharges from the Cape Coral area, GAC shall deed to the State, on the date of entry of this Consent Order, the lands owned by GAC as are described in the warranty deeds attached as Exhibits 3(a), 3(b) and 3(c).

5. GAC will deposit to the account of the Department's Pollution Recovery Fund the sum of \$200,000 per year, each year for five (5) consecutive years, the first such deposit to be made within thirty (30) days of the entry of this Consent Order and following payments to be made on or before the annual anniversary date of the date of entry of this Consent Order. All money deposited in the Pollution Recovery Fund to the account of GAC projects shall be identified and all interest earned on the account of GAC projects shall be credited to the Pollution Recovery Fund account of these GAC projects. This money shall be used at the discretion of the Secretary of the Department, which use shall nonetheless be restricted in use to study water quality and quantity problems in the Cape Coral and Golden Gate Estates areas, to propose solutions to the problems identified, and as funds allow, to correct the identified problems in both projects. No more than \$200,000 may be spent in any one fiscal year without the approval of GAC.

6. GAC hereby agrees to withdraw all permit applications pending for the Cape Coral development (File Numbers 36-10-3545, 36-24-3827, 36-10-3546 and 36-20-0274) on the same date as the entry of this Consent Order. The Department agrees

that this Consent Order will provide the necessary authorization to complete the work described in Exhibits 1 and 2. This Consent Order waives certification under PL 92-500, Section 401.

7. This Consent Order is enforceable under Section 120.69, Florida Statutes and can also be enforced under Section 403.161(1)(b), Florida Statutes.

JAMES E. YACOS and JOHN RODGERS CAMP, JR., as Co-Counsel for the Co-Trustees of GAC Corporation, et al.

By: *John Rodgers Camp, Jr.*
JOHN RODGERS CAMP, JR.
DEPARTMENT OF ENVIRONMENTAL
REGULATION:

Terry Cole
TERRY COLE
Deputy General Counsel

Consented to by GAC this _____ day of _____,
1977.

Herbert S. Freehling
HERBERT S. FREEHLING
as Co-Trustee

Frank J. Callahan
FRANK J. CALLAHAN
as Co-Trustee

DATED AND ENTERED this 19 day of April,
1977.

Joseph W. Landers, Jr.
JOSEPH W. LANDERS, JR.
Secretary

Department of Environmental
Regulation
2562 Executive Center Circle, E.
Montgomery Building
Tallahassee, Florida 32301

RECEIVED

MAY 04 1979

DEPT. SO. FLA. DISTRICT

BEFORE THE STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

DEPARTMENT OF ENVIRONMENTAL)
REGULATION)

vs.)

GAC PROPERTIES, INC.,)

Lee County, Florida.)

MODIFICATION TO CONSENT ORDER

The Department of Environmental Regulation (herein referred to as the "Department") and Frank J. Callahan and Herbert S. Freehling, as Co-Trustees of the GAC Corporation, GAC Properties Credit, Inc., and GAC Properties, Inc. (hereinafter referred to as "GAC") in executing the provisions of Consent Order No. 15 have found that certain modifications need to be made to the above mentioned Consent Order in order to carry out the environmental aims of the order.

Accordingly, the previously executed Consent Order (Order No. 15) is modified as follows:

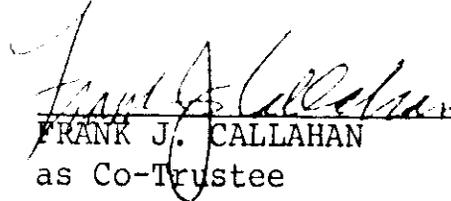
1. All mosquito control ditches or other water courses in Unit 29 to be intersected by the spreader canal will be plugged east of and adjacent to the spreader canal excavation in a manner previously approved by the Department's district office;
2. All excavated material will be deposited in a location previously approved by the Department's district office;
3. The South Florida District Office of the Department is delegated the authority to approve in writing minor changes in the design of the spreader canal which it finds will enhance the function of the spreader canal or preserve additional wetland areas; and
4. Exhibit 2 of the Consent Order (Order No. 15) is modified by agreement of the parties as shown on the attachment

to this Modification to Consent Order and which is marked
Exhibit 2, plate 3, revised December/1978.

Consented to by GAC this 18TH day of April, 1979.

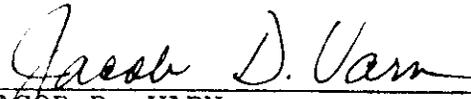


HERBERT S. FREEHLING
as Co-Trustees



FRANK J. CALLAHAN
as Co-Trustee

DATED AND ENTERED this 27TH day of April, 1979.



JACOB D. VARN
Secretary

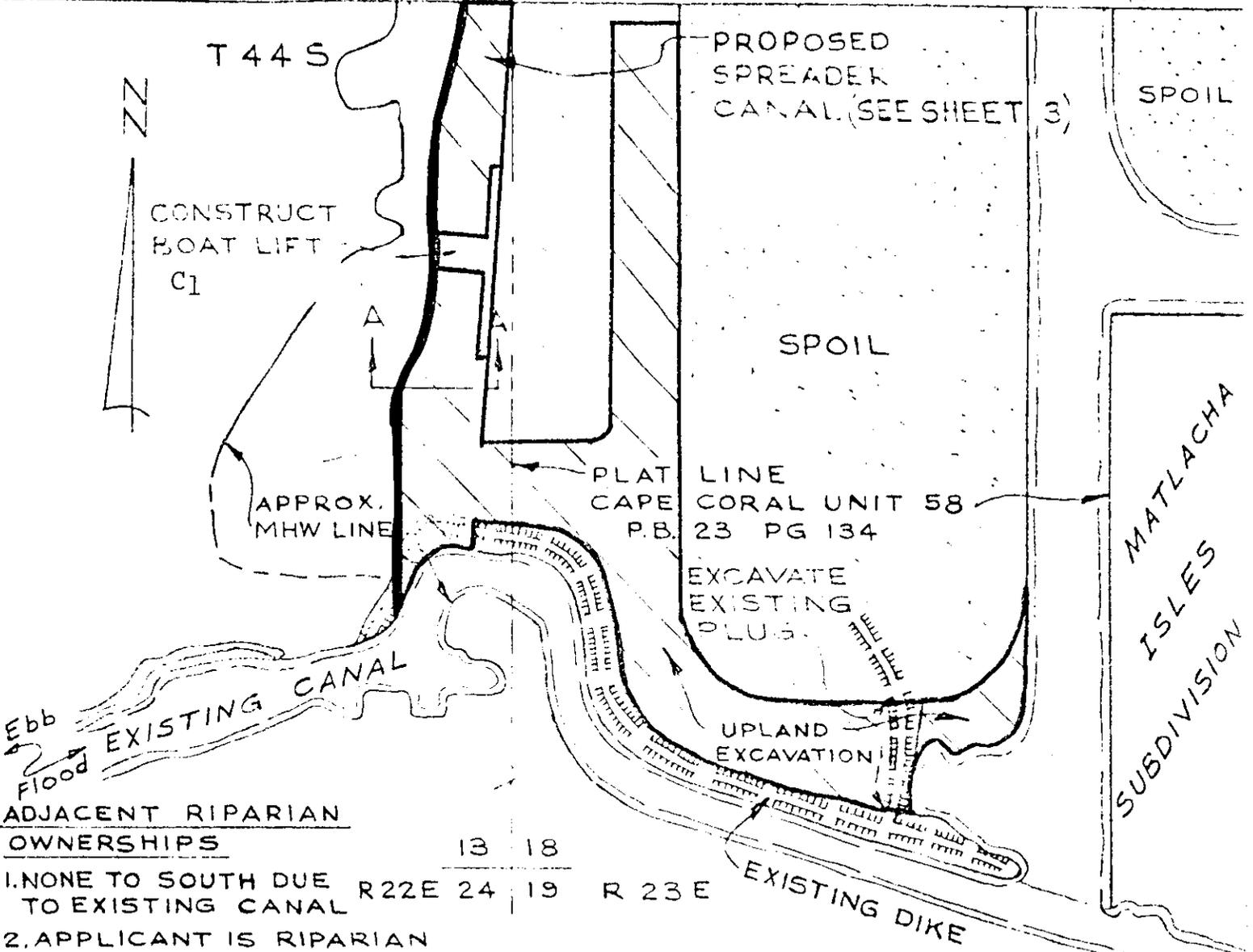
Department of Environmental
Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32301



H. M. Erwin

C₁

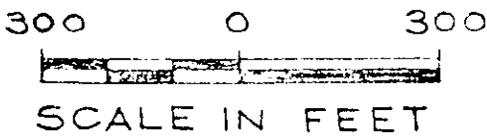
35-20-0274
72K-1436



ADJACENT RIPARIAN OWNERSHIPS

	13	18
1. NONE TO SOUTH DUE TO EXISTING CANAL	R 22 E 24	R 23 E
2. APPLICANT IS RIPARIAN OWNER FOR 38,000 FT. NORTH.		

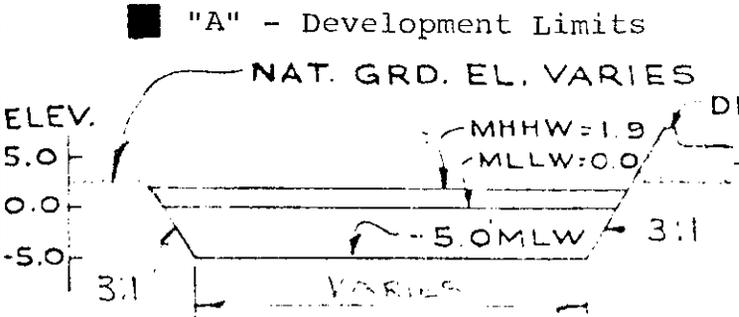
PLAN



NOTES:

1. ALL ELEVATIONS REFER TO MLLW DATUM.
2. APPROX. 3800 C.Y. OF SAND WITH ORGANIC MATERIAL TO BE DREGGED FROM BELOW MHW LINE AND PLACED ON APPLICANT'S UPLAND PROPERTY BEHIND SUITABLE DIKES.

REV. 11/76 REV. 12/73
REV. 2/73 REV. 5/73
REV. 12/72



SECTION 'A-A'

SCALE IN FEET

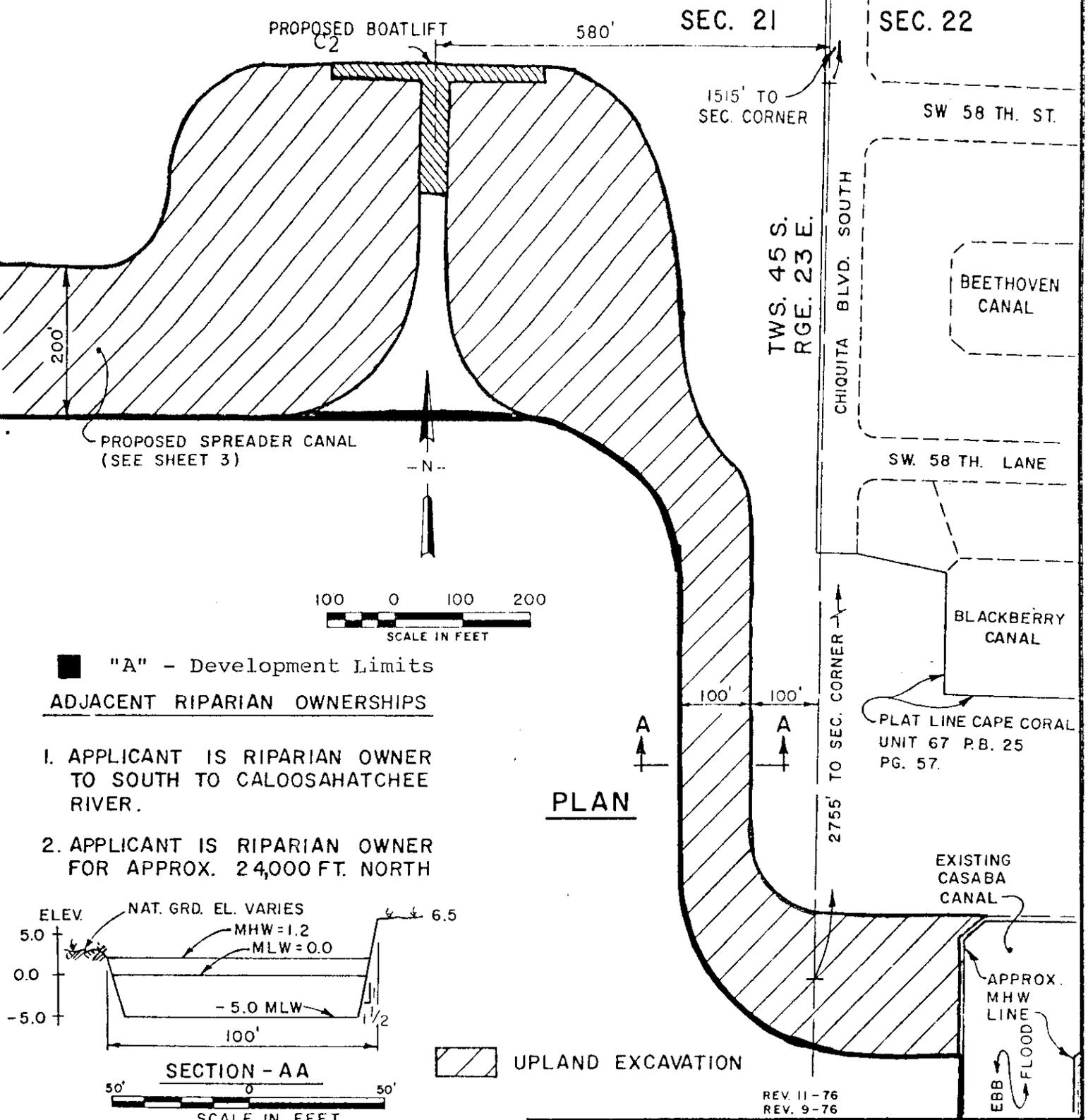
50 0 50

GEE & JENSON CONSULTING ENGINEERS, INC. WEST PALM BEACH, FLORIDA			
CHANNEL EXCAVATION & LIFT CONSTRUCTION MATLACHA PASS CAPE CORAL, LEE COUNTY, FLORIDA APPLICANT - GAC PROPERTIES, INC.			
DESIGNED D. H. D.	DRAWN GB	CHECKED JmW	JOB NO. 71-133
DATE June 72	SCALE ~	APPROVED J.A.H.	DRAWING NO. FILE NO.
			SHEET 1 OF 3

C₂

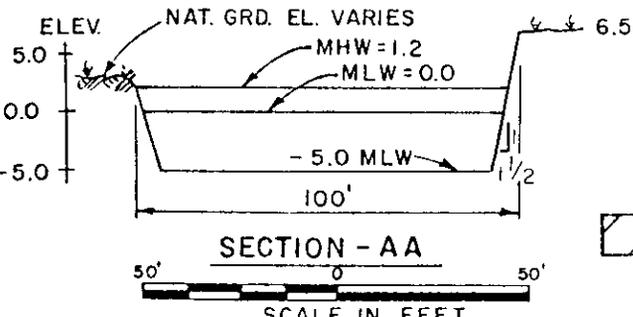
NEW PLAT AREA SOUTHWEST

36-10-3546
75K-1005



■ "A" - Development Limits
ADJACENT RIPARIAN OWNERSHIPS

1. APPLICANT IS RIPARIAN OWNER TO SOUTH TO CALOOSAHATCHEE RIVER.
2. APPLICANT IS RIPARIAN OWNER FOR APPROX. 24,000 FT. NORTH



NOTES

1. ALL ELEVATIONS REFER TO MLW DATUM.
2. APPROX. 3,200 C.Y. OF SAND WITH ORGANIC MATERIAL TO BE REMOVED FROM BELOW MHW LINE AND PLACED ON APPLICANT'S UPLAND BEHIND SUITABLE DIKES.

REV. 11-76
REV. 9-76

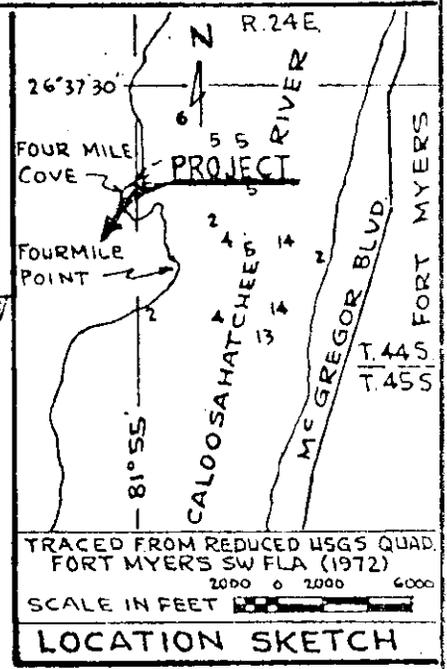
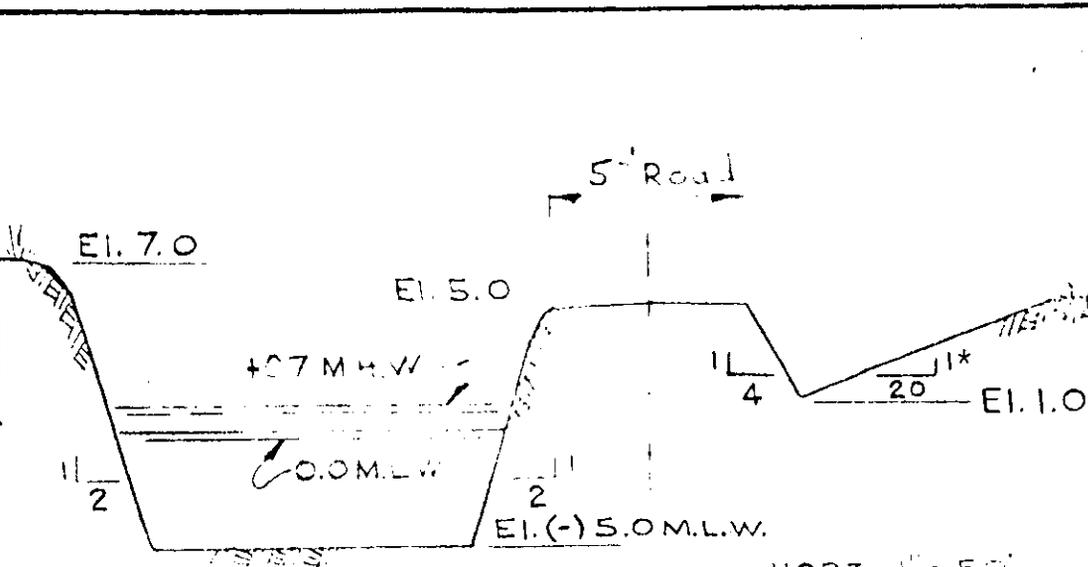
CHANNEL EXCAVATION & LIFT CONSTRUCTION
MATLACHA PASS & CALOOSAHATCHEE RIVER
CAPE CORAL, LEE COUNTY, FLORIDA
APPLICANT - GAC PROPERTIES, INC.

DESIGNED P. M.	DRAWN M. M.	CHECKED	JOB NO. 71 - 133	DRAWING NO.
DATE MAY 75	SCALE NOTED	APPROVED	FILE NO.	SHEET 1 OF 3

UNIT 89

36-10-3545
75K-1006

C₃



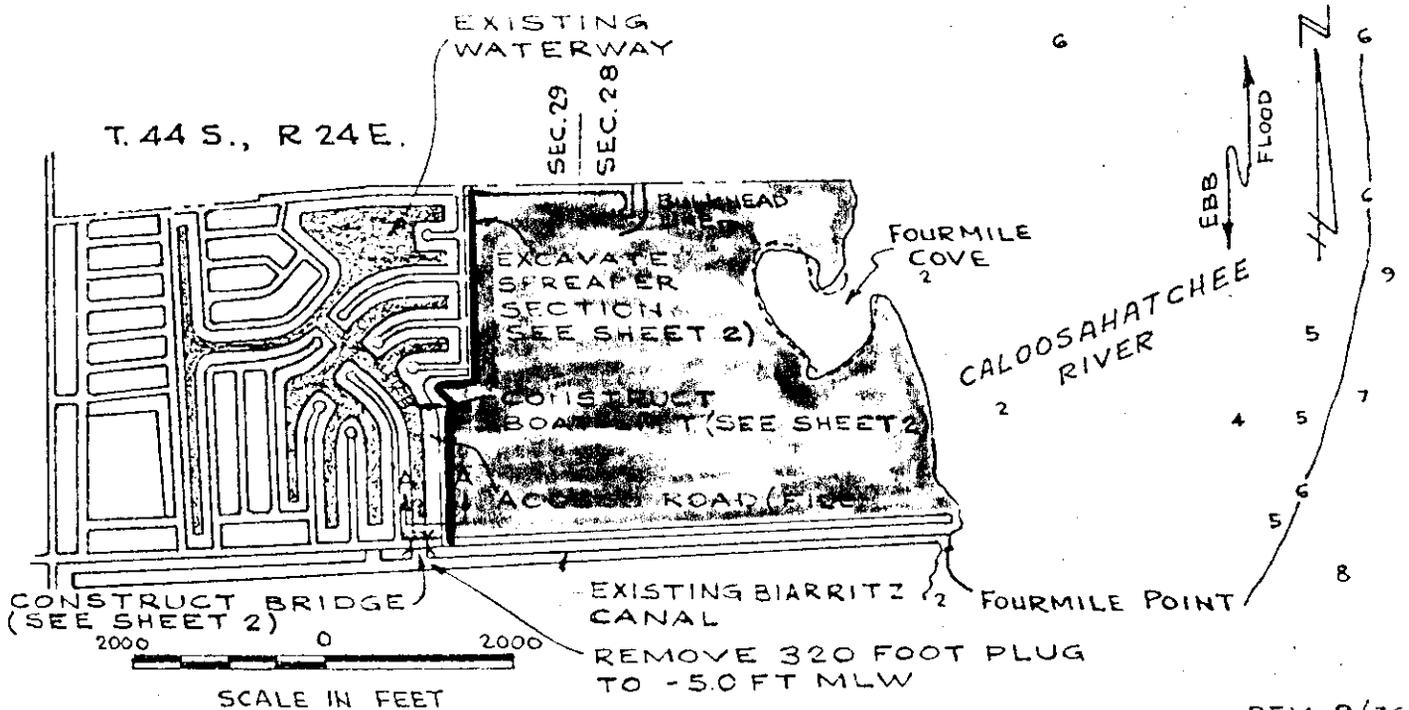
SCALE: HORIZ. 1" = 50'
VERT. 1" = 10'

SECTION A-A

- "A" - Development Limits
- ▣ Preserve Area

*1:20 or the landward edge of wetland vegetation.

NOTE: ALL ELEVATIONS REFER TO M.L.W. DATUM.



NOTE

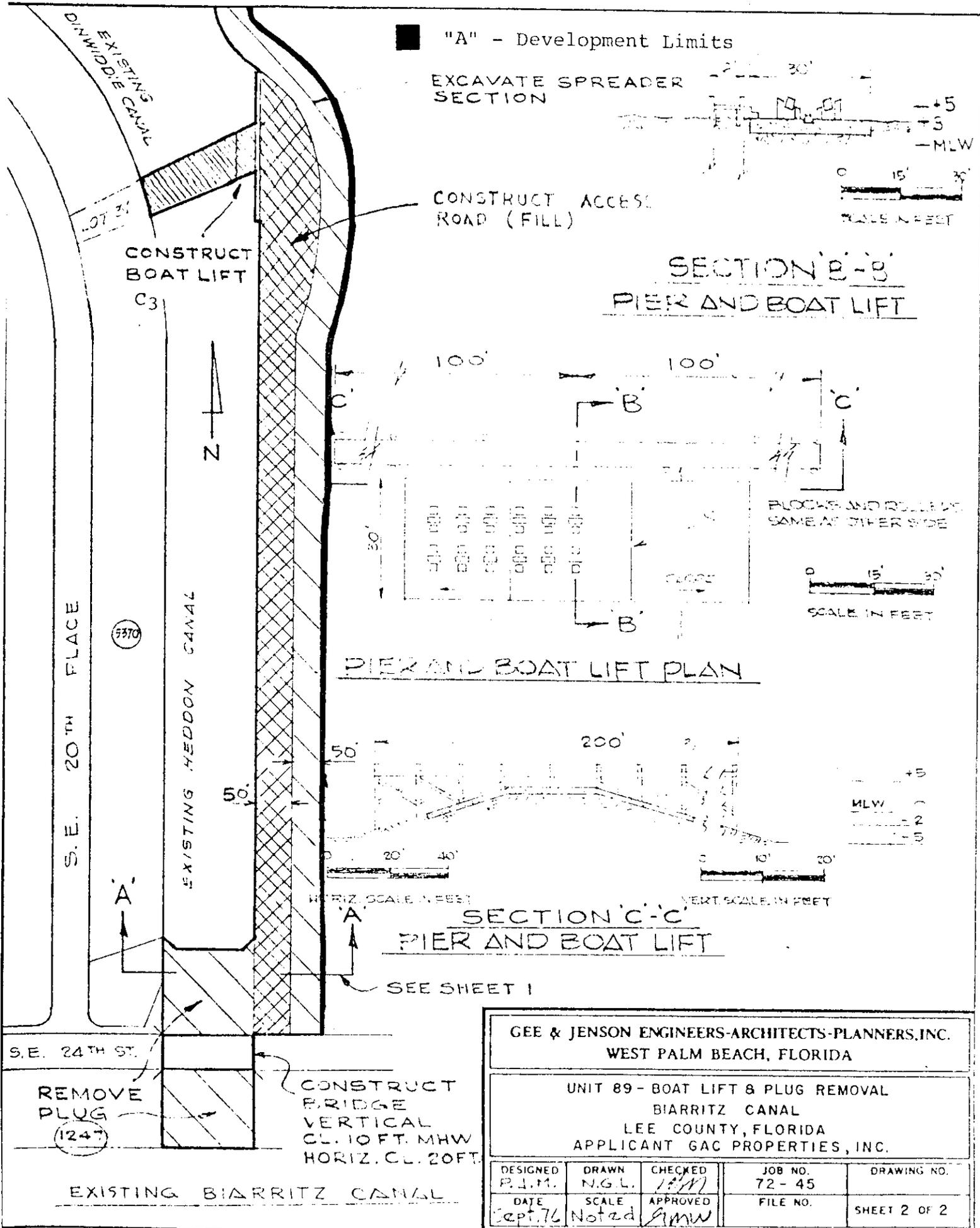
APPROXIMATELY 600 C.Y. OF SANDY MATERIAL TO BE DREDGED FROM BELOW MHW LINE AND PLACED ON APPLICANTS UPLAND BEHIND SUITABLE DIKES.

SEE ATTACHED LIST FOR ADJACENT RIPARIAN OWNERS.

REV. 9/75

GEE & JENSON CONSULTING ENGINEERS, INC. WEST PALM BEACH FLORIDA				
UNIT 89 DEVELOPMENT & CHANNEL BIARRITZ CANAL LEE COUNTY, FLORIDA APPLICANT: GAC PROPERTIES, INC.				
DESIGNED D.H.D.	DRAWN MGB	CHECKED <i>[Signature]</i>	JOB NO. 72-45	DRAWING NO.
DATE MAY 75	SCALE NOTED	APPROVED <i>[Signature]</i>	FILE NO.	SHEET 1 OF 2

C₃



■ "A" - Development Limits

EXCAVATE SPREADER SECTION

CONSTRUCT ACCESS ROAD (FILL)

CONSTRUCT BOAT LIFT

SECTION B-B
PIER AND BOAT LIFT

PIER AND BOAT LIFT PLAN

SECTION C-C
PIER AND BOAT LIFT

SEE SHEET 1

REMOVE PLUG (1247)

CONSTRUCT BRIDGE VERTICAL CL. 10 FT. MHW HORIZ. CL. 20 FT.

EXISTING BIARRITZ CANAL

GEE & JENSON ENGINEERS-ARCHITECTS-PLANNERS, INC.
WEST PALM BEACH, FLORIDA

UNIT 89 - BOAT LIFT & PLUG REMOVAL
BIARRITZ CANAL
LEE COUNTY, FLORIDA
APPLICANT GAC PROPERTIES, INC.

DESIGNED P.J.M.	DRAWN N.G.L.	CHECKED 1/2/77	JOB NO. 72-45	DRAWING NO.
DATE Sept. 76	SCALE Noted	APPROVED AMW	FILE NO.	SHEET 2 OF 2

Exhibit 2 Plate 5

Construction of the boat lifts shall be to the following criteria:

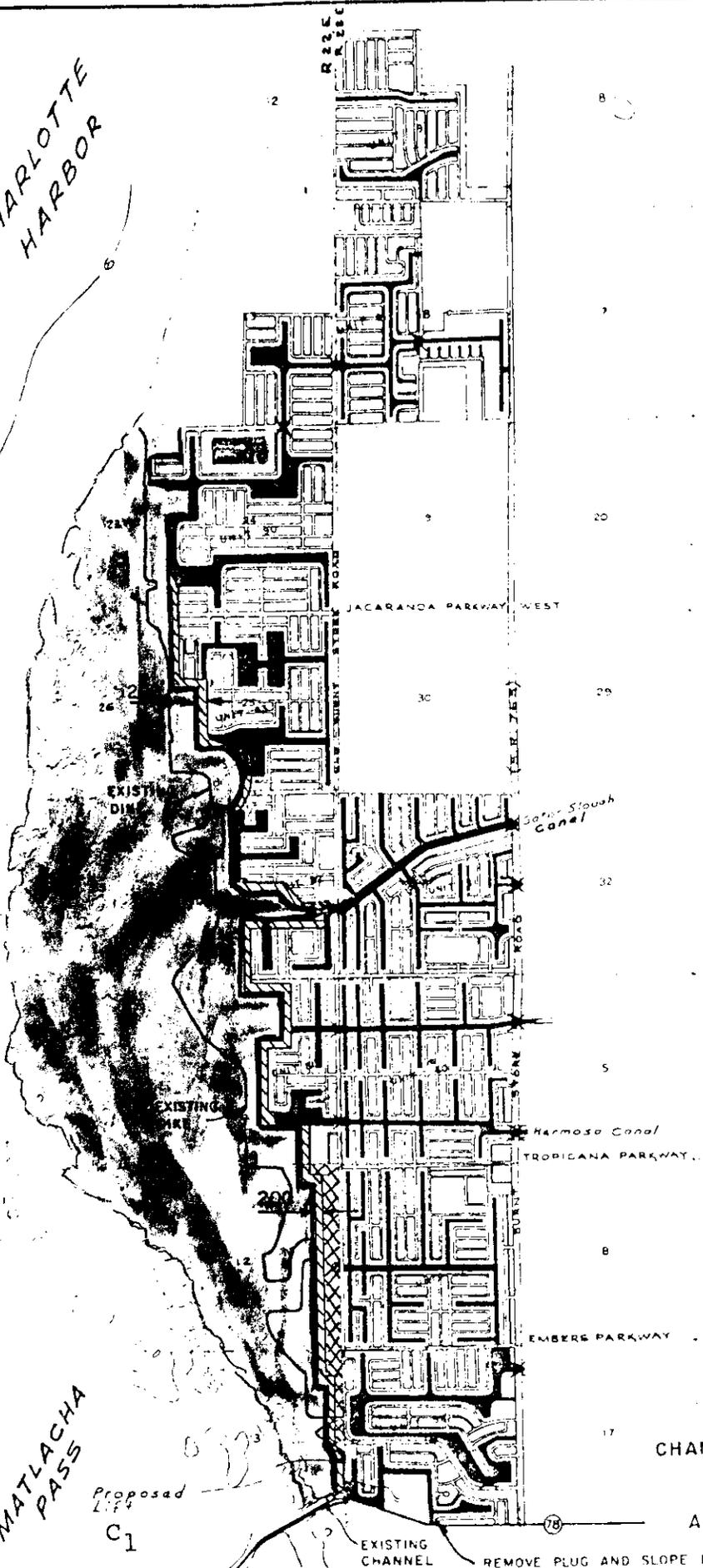
- 1 - No transfer of water between the spreader waterway and state waters will be allowed.
- 2 - No part of the boat lifts will encroach beyond line A of Exhibit #1.
- 3 - The lift locations may be moved upstream from Locations C1, C2 and C3 up to 100 feet as long as such relocation does not open additional interior canals to state waters. The location of the boat lift may be moved downstream.
- 4 - The height, width and length of the earthen dam will be determined after establishing the seaward elevation of the spreader waterway and completing the hydraulic analysis.
- 5 - The type of mechanical transfer equipment will be at the discretion of GAC and its design engineer.

SPREADER WATERWAYS

36-20-0274
72-143G

CHARLOTTE HARBOR

MATLACHA PASS



LEGEND

- ▲ WEIR
- ✕ BRIDGE
- ▨ SPREADER CANAL
- PLATTED WATERWAYS
CAPE CORAL UNITS 58, 59, 60, 61, 81, 82, 83, 90, 91 & 97 - FILL FOR DEV.
- ▩ FILL FOR DEVELOPMENT

REMOVE EXISTING DIKE TO NATURAL GRADE EXISTING PRIOR TO DIKE CONSTRUCTION.

REMOVE ANY EXISTING FILL WEST OF SPREADER CANAL.

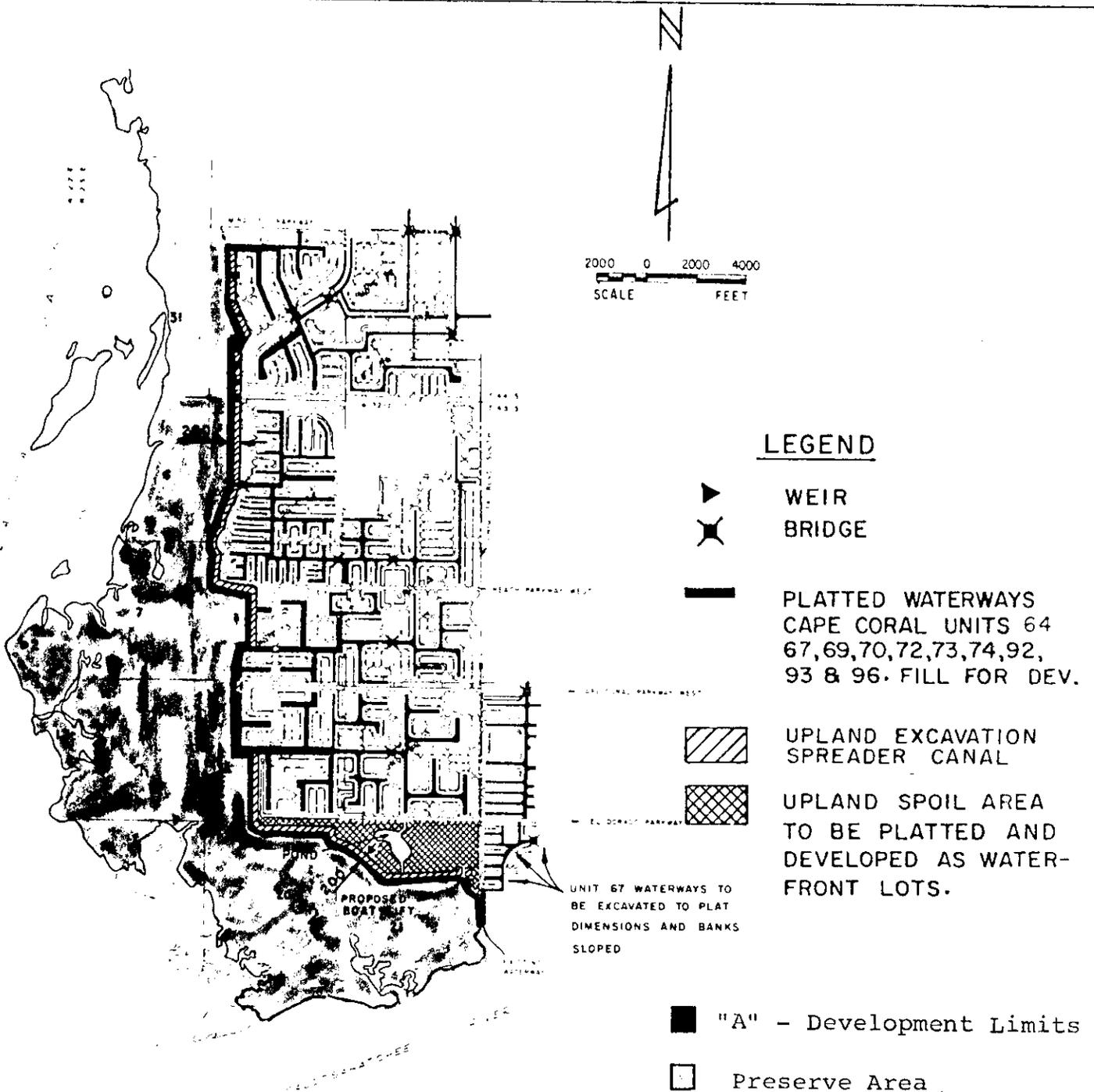
- "A" - Development Limits
- ▩ Preserve Area

CHANNEL EXCAVATION & LIFT CONSTRUCTION
MATLACHA PASS
CAPE CORAL, LEE COUNTY, FLORIDA
APPLICANT - GAC PROPERTIES, INC.

Proposed
C1

EXISTING CHANNEL
REMOVE PLUG AND SLOPE BANKS
TO OBTAIN UNIT 58 PLAT DIMENSIONS

11/76
10/76 SHEET 3 OF 3
5/76



LEGEND

- ▲ WEIR
- ✕ BRIDGE

— PLATTED WATERWAYS
CAPE CORAL UNITS 64
67, 69, 70, 72, 73, 74, 92,
93 & 96. FILL FOR DEV.

▨ UPLAND EXCAVATION
SPREADER CANAL

▩ UPLAND SPOIL AREA
TO BE PLATTED AND
DEVELOPED AS WATER-
FRONT LOTS.

UNIT 67 WATERWAYS TO
BE EXCAVATED TO PLAT
DIMENSIONS AND BANKS
SLOPED

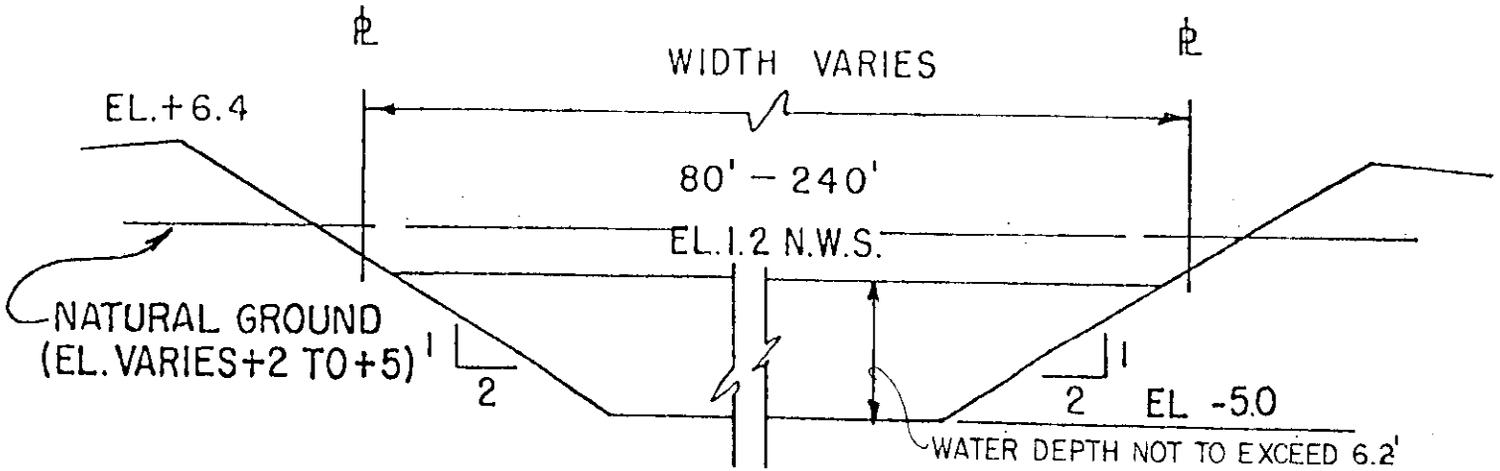
■ "A" - Development Limits

□ Preserve Area

CHANNEL EXCAVATION & LIFT CONSTRUCTION
MATLACHA PASS & CALOOSAHATCHEE RIVER
CAPE CORAL, LEE COUNTY, FLORIDA
APPLICANT - GAC PROPERTIES, INC.

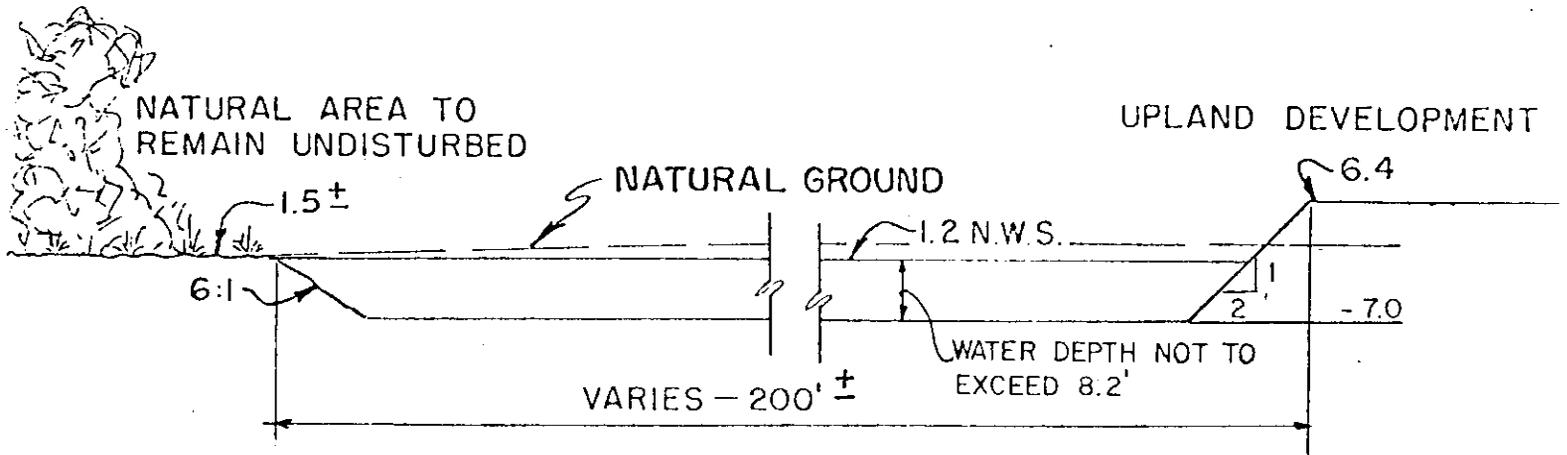
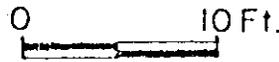
CROSS SECTIONS
 INTERIOR CANALS AND SPREADER WATERWAY

36-20-02,
 72K-1436



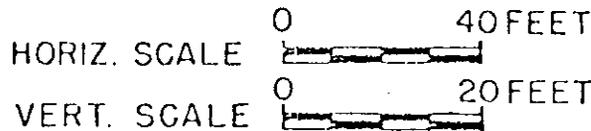
TYPICAL CANAL SECTION

SCALE



TYPICAL SECTION

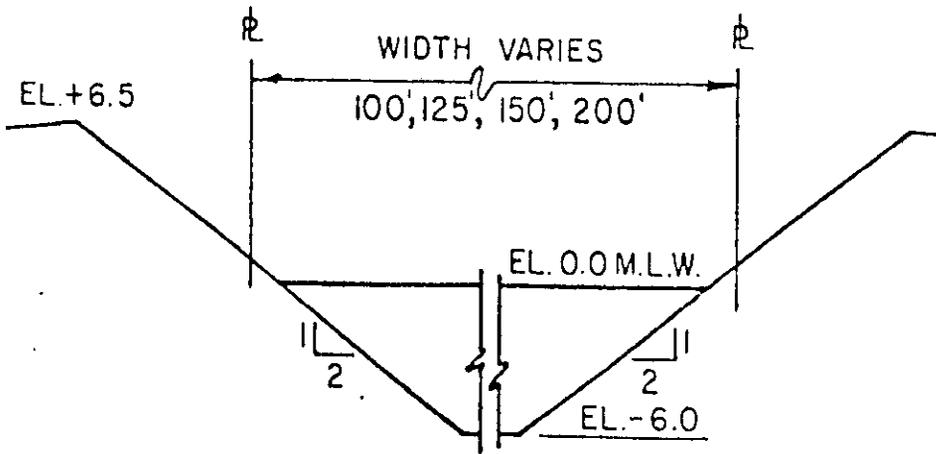
SPREADER WATERWAY EXCAVATION



NOTES: ALL ELEVATIONS REFER TO
 MEAN SEA LEVEL DATUM.

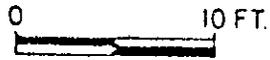
N. W. S. - NORMAL WATER SURFACE.

CHANNEL EXCAVATION & LIFT CONSTRUCTION MATLACHA PASS CAPE CORAL, LEE COUNTY, FLORIDA APPLICANT: G.A.C. PROPERTIES, INC.				
DESIGNED D.H.D.	DRAWN G.J.B.	CHECKED J.J.J.	JOB NO 71-133	DRAWING NO. .
DATE 12-75	SCALE NOTED	APPROVED .	FILE NO .	SHEET OF .

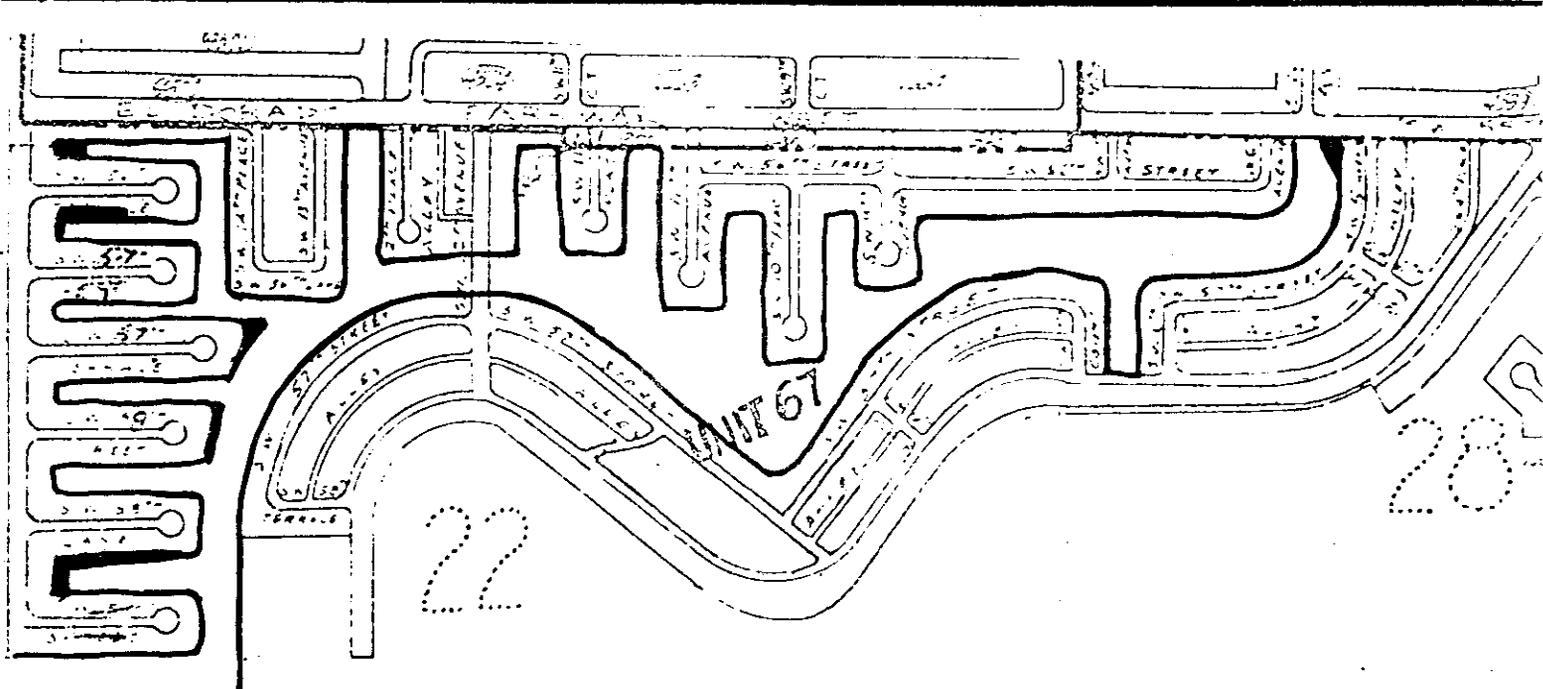


UNIT 67

TYPICAL CANAL SECTION (THOSE TO BE DUG)



NOTE: ALL EL. REFER TO MLW



■ TO BE EXCAVATED	65,000 C.Y.
■ PLUS SLOPE ALL BANKS	35,000 C.Y.
	<hr/>
	100,000 C.Y.
■ CANAL OVER DUG TO BE FILLED	8,500 C.Y.
FILL FOR LAND AREAS	250,000 C.Y.

Scale 1" = 1,000'

The Hydraulic Assessment is to evaluate and recommend adjustment to the water surface elevations, as required, to assure maximum retention and management of surface water while providing reasonable protection of the Cape Coral area from flooding during storms.

Included in the Assessment are the off-site drainage basin, storm drainage system evaluation, waterway analysis, control structure analysis, and discharge through the perimeter spreader waterway.

A report will be prepared depicting the Hydraulic System Assessment and recommendations for improvements to the system, such improvements to be implemented according thereto by GAC, upon concurrence by the District DER office.

EXHIBIT 3

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City/State/Zip	Bethany Beach DE 19930	Author(s)	Ward & King
Country	USA	Article/Paper title	Perimeter canal ..
Attention		Volume/Issue/Date	
Email address	jmikehannon@gmail.com	Pages	99 - 129
Phone number	202-365-5561	Call number	TC803 .S6 1973
Fax number		Notes	
FedEx number			
Credit card number	CC		
Credit card expiration			
Credit card name	CC		

31

anning programs. It seems apparent that
of systems analysis, a substantial research
development of methodologies that would en-
l levels of government to address the entire
r use problems that have been associated with
urban shift that has taken place in this
logical approach would need to take into account
in its relationship with the allocation, use,
development of all resources.

ecisions relating to these problems are the
assigned to the investment of public funds in
tal conditions, including the possible redis-
ces where this appears necessary to support
or to provide food and fiber production
this country and the rest of the world.

goals of the nation are defined in the light
ntly urban society, finding solution of social
s engendered by getting from where we were to
want to go will be hampered by conflicting

"THE PERIMETER CANAL - A NEW APPROACH TO DISCHARGE
URBAN WATER INTO A COASTAL MANGROVE AREA"

Charles H. King, Jr., M. ASCE, Civil Engineer¹

Gerald M. Ward, Mechanical Engineer²

The west coast of Florida has experienced phenomenal growth in both residential and commercial development in the past decade. The coastal areas from Tampa to Fort Myers have been the focal point of this activity.

One of the principal reasons for the growth is the development of large "homesite" communities such as Cape Coral, Punta Gorda Isles and Port Charlotte.

Cape Coral, developed by GAC Properties, Inc., is situated in western Lee County, some seven miles southwest of the City of Fort Myers (Plate 1). Cape Coral occupies 64,000 acres of a peninsula between the Peace and the Caloosahatchee Rivers (Plate 2).

I. WATER MANAGEMENT CONSIDERATIONS

This paper will direct its attention to the watershed area (which includes a portion of Cape Coral) comprising seventy-four square miles (Plate 2) and includes two basic areas of analysis.

(1) An area east of U.S. 41 which contains a part of the C.M. Webb Wildlife Management Area, consisting of thirty-three square miles and drains in a southwest direction across U.S. 41 into a previously excavated drainage channel named Gator Slough Canal.

(2) An area west of U.S. 41 and north of State Road 78 consisting of forty-one square miles eventually draining into the proposed perimeter canal adjacent to Matlacha Pass.

Past engineering technique which would have been used in the drainage design of this area would have included the following:

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(1) A location would have been chosen for a straight outfall canal following existing land lines from the coastal zone upstream to some point of drainage concern.

(2) The design drainage discharge for the system would have been computed either by the "Rational Method," Soil Conservation Service "Drainage Coefficient Curves," or locally developed rainfall-runoff relationships applicable to the physiographic area.

(3) A straight outfall section would have been dredged from upland canal section through the coastal mangrove zone to some point offshore probably to depths of (-6.0) Mean Low Water. The spoil from this construction would have been deposited either to create fill land in the coastal zone or wasted through the adjacent shallow mangrove area.

(4) Each of the upland canal segments would have been subsequently designed as a separate unit depending upon the land uses and economics.

Relatively few, if any, drainage channels within the state are or have been designed using acceptable methods of design for urban flood protection, future land use, and environmental protection of discharge into the receiving body. (In this case an estuary of the Gulf of Mexico.)

One of the most negative results of the straight outfall canal was the transportation and deposition of coloidal material on the shallow bay bottom flora and fauna by the upland canal discharge.

The Cape Coral drainage canal system originated during the era of the above approach.

With the advent of the National Environmental Policy Act (NEPA) of 1969 there existed a growing concern regarding the acceptability of past practices used in coastal drainage design as well as the damage done by the ocean or tide outfall. Added concern centered on wind, tide, and flood information contained in coastal hurricane studies published by the Corps of Engineers.

Armed with these facts it was decided that a new approach to these problems must be attempted which would lessen the impact of coastal development as well as providing the civil engineer with a real application of the design principle.

Recognizing the basic limitations of the "Rational Method" of hydrologic analysis, the U.S.D.A. Soil Conservation Service, TR-20, Project Formulation Computer Program - Hydrology (Supplemented) was selected. The most recent version of this program has been adapted to an IBM 1130 which is readily accessible to consultants.

The other reasons the TR-20 program was used are:

- (1) Complex hydraulic cover variations can be considered.
- (2) National Soil Associations can be identified and runoff values estimated from research values.
- (3) Storm rainfall distribution can be varied.
- (4) Present and future cover (urban and agriculture) can be analyzed simultaneously.
- (5) Hydrographs can be easily added together or modification introduced.
- (6) Many storms can be analyzed quickly.
- (7) Structure hydraulics can be modified, included or deleted.
- (8) "Time of Concentration" values or lag values for each sub unit are used.
- (9) Reservoir routings of ponding (storage) areas are available.
- (10) Critical boundary conditions can be more readily identified.
- (11) Answers are available for analysis in short time.

In preparing the basic data for analysis and subsequent coding into program input format the following steps were taken (See Figure 1):

- (1) Basin Watershed Map was prepared showing the boundary of the watershed and the existing channel system (See Plate 2).

Drainage maps, unit maps and plat maps for development of GAC Properties, Inc. were furnished for utilization in the analysis. Field surveys in the Cape Coral area were used to obtain actual canal cross sections and geometry for design purposes. Flood

plain information of Charlotte and North Lee Counties was available from the Corps of Engineers.

(2) Sub Watershed Area Map showing the inflow and outflow conditions (See Plate 3).

Drainage maps and plats supplied by the developer were used to determine drainage divides within the Cape Coral project. These divides generally were along roads constructed within the project.

In the area north of Gator Slough and east of U.S. 41, drainage boundaries were projected to agree with the internal boundary development of the Cape Coral project.

Drainage divides in the C.M. Webb Wildlife Management Area are available from various drainage and quadrangle maps of the area.

(3) Soils Map delineating national soil associations including the Adamsville, Pompano, Broward and Keri, which are poorly drained where drainage improvements have not been made.

(4) Runoff Curve Numbers - A runoff curve number, derived from a physical land use analysis of the area, determined the theoretical runoff rate. The runoff curve number is analogous to the percent runoff used in the rational method of runoff computation with the exception that the runoff is a nonlinear function of rainfall depth.

The typical residential area in the Cape Coral Development is comprised of 75.4% permeable surface areas and 24.6% impervious surface (including water surface). Of the runoff from the impervious areas, 25% of the 24.6% is considered to discharge onto permeable areas which have not yet reached infiltration capacity. This adjusts the runoff parameters to yield 81.5% permeable area having a runoff curve number of 62, and 18.5% impervious surface having a runoff curve number of 96. Using these adjusted parameters, the weighted runoff curve number was determined to be 68.

(5) Rainfall Frequency Analysis - Technical Paper - 40, United States Weather Bureau was used to determine depths and return periods for the partial duration series (Plates 4 & 5). Also, certain rainfall floods of record were analyzed.

(6) Storm Distribution Curves were required to proportion storm rainfall over storm duration period (Plate 6).

(7) Time of Concentration or Lag Time was computed from average velocities within banks on computed water profile slope through hydraulic unit.

(8) Stage - Storage Curves - Curves of storage vs. elevation were derived from the physical geometry of the canals and lakes (Plate 7). Analysis was based on the entire system of canals in a basin acting as a single reservoir.

(9) Rating Curves - Rating curves for both canals and structures were required for a thorough analysis. Rating curves for structures were developed for weirs using the relationship: $Q = CLH^{3/2}$

Where: Q = discharge over the weir in cfs
C = weir coefficient in feet^{1/2} per second
L = weir length in feet
H = head on the weir in feet

Rating curves for bridges and canals were developed using reliable computer programs which analyzed these systems using empirical data, Manning's equation and Bernoulli's energy theorem.

Technical Solution - The system of weirs and bridges was to be designed for a "10 year storm" and checked for a "25 year storm." The analysis began by determining which "10 year storm" was critical for the area under analysis. Each individual watershed was analyzed by sequencing 10 year storms of various durations and rainfall depths. The storm which produced the greatest head on the weir was considered the most critical storm for the individual basin being considered.

Having determined the most critical storm for individual basins, the next process was to determine the critical storm for the entire watershed as an interconnected body.

Using the above mentioned approach, both severe local storms and storms covering large areas were considered. Design criteria was based on the storm which produced the most critical conditions of discharge and elevation.

Using Technical Paper 40, rainfall depths for a 24 hour, 10 year storm and a 24 hour, 25 year storm were found to be 8.0 inches and 9.2 inches respectively. For basins larger than a few square miles, an area-depth correction factor must be applied to convert point rainfall values to area rainfall. Thus, for basins interconnected with Gator Slough, east of Burnt Store Road (S.R. 765), a total watershed of 68 square miles, the reduction factor selected from Technical Paper 40 was 0.94, which reduced the point rainfall depths of 8.0 and 9.2 inches to area rainfall depths of 7.5 and 8.6 inches respectively.

Rainfall depths for other basins were corrected in a similar manner. The peak flows under U.S. 41 for a 24 hour, 10 year storm and a 24 hour, 25 year storm were determined to be 2,607 cfs and 3,174 cfs respectively.

The procedure for analysis by use of the "TR-20" computer program was one of routing the combination of several hydrographs through a system of reservoirs. A runoff hydrograph for an upstream basin was developed using the unit hydrograph, storm distribution pattern, and certain physical parameters for the area. The resulting runoff hydrograph was routed through the reservoir using the storage and structure rating curves for the basin (Plate 8).

A flow and depth are required at each bridge for its analysis. To determine these parameters, what occurs within the individual basin at the time the peak occurs at the weir must be observed. At the time the peak occurs on the discharge hydrograph, the change in water surface elevation with respect to time is zero. This implies that there is no change in storage with respect to time and therefore, basin inflow must equal the outflow. Inflow can be in the form of storm runoff and/or flow accepted from basins upstream. The difference between the peak basin discharge and the sum of the inflows from upstream basins is the inflow resulting from the storm runoff. This difference can be distributed according to drainage area and a runoff factor so that flows in various canals can be determined (Plate 9). Once the canal flows were established programs which develop backwater profiles through canals and bridges were used to determine water surface elevations and velocities throughout the canal system.

Special Design Considerations

Gator Slough - Certain basic assumptions, both physical and hydraulic, were made in order to perform the hydrological analysis of the watershed. The assumption was made that the hydrograph for the area west of U.S. 41 via Gator Slough would not be greatly changed by development. Because the area east of U.S. 41 is primarily a wildlife management area, it was assumed that much of the basin will remain undeveloped. If, in fact, the area does develop, additional retention areas and control structures on Gator Slough will be required to limit the flow under U.S. 41.

The area lying west of U.S. 41 was analyzed as a fully developed tract for the Lee County Drainage Plan. The undeveloped areas along Gator Slough were assumed to have the same percent water surface when developed as the adjoining developed areas. This assumption was made because fill from the canals would be needed to raise these undeveloped land areas enough to have the same level of flood protection as the adjoining developed areas.

The submergence of a flow control structure (weir) was determined to have a minimal retarding effect within the ranges of downstream submergence observed on the discharge over the structure. Therefore, the relationship between weir discharge and surcharge was assumed to be valid for all designed conditions.

Radii at canal junctions and bends were assumed to be sufficiently large to allow minimal losses at these points. Computed velocities in the canals were determined to be small in support of this assumption. In most cases, canals have been dug to large cross sections for fill, recreation and esthetic purposes of development.

Canal seepage was considered a negligible outflow when compared to discharge over a control structure. Seepage at early storm stages will be balanced by canal recharge after the storm.

Cross connections were required at several locations along Gator Slough to relieve the excessive peaks of the flood hydrograph in the canal. A major contribution to the flood hydrograph in the Gator Slough is the runoff from the area east of U.S. 41. A hydrograph generated by this runoff reaching a full basin in Gator Slough would flood many areas if no relief through other control structures was provided. Cross connections allow the control structures to work in parallel, thus providing a diversion of flow to other control structures for a gradual release. Since the peak flow in Gator Slough occurs a number of hours after the cross connected smaller drainage basins have peaked, these connections tend to reduce peak flows for both systems.

Certain controls upon future development must be imposed on the area. Areas which are not currently incorporated within the drainage boundaries of the project should remain excluded unless the proper storage and discharge requirements can be effectively controlled. If additional storage is incorporated into a basin's existing storage, the drawdown time will be extended. If there is additional inflow to a basin via a control structure, both the head and the drawdown time will be increased. Therefore, a detailed analysis of the basins involved will be necessary if additional areas are to be incorporated into the existing drainage boundaries.

The line of flow control structures which form the salt water intrusion barrier were developed for several reasons. They regulate the water table in the area by keeping water at a high level behind the structures. This nearly constant head behind the structure prevents salt water intrusion upstream of the weirs. Had the structures not been constructed, subsurface salt water intrusion would become a major problem as fresh water uses within the area are increased.

Additional protection against the salt water intrusion was provided by using backwater flap gates on the control structures. In the event of an abnormally high tide, the flaps on the weirs at S.R. 765 will close and help prevent salt water from flowing upstream over the weirs.

Control structures were designed to build a head within the basin, i.e., design tides were considered to be accompanied by a design storm. Should any salt water be washed over the weir flap gates, the flows produced by the storm would normally provide ample flushing capabilities. Manually-operated sluice gates and pipes were provided at the salt water barriers to allow additional flushing of salt water, should extreme storm tides ever top the flap gates. These sluice gates are capable, if necessary, of discharging the total stored volume in a period of approximately 72 hours.

Cross connections between basins having equal normal water surface elevations were provided by using equalizer pipes of various sizes. The pipes were designed to allow ample flow between the basins, while maintaining a head differential for additional flushing.

In some cases, the establishment of flows in the long dead-ended canals required the design of additional structures, which provided flow from a basin with a normal water elevation higher than that in the basin containing the dead-ended canal. This action would occur each time the water level in the upper basin exceeds the normal controlled water level, thus providing added circulation and preventing a stagnant condition from occurring in the dead-ended canal. (See Plate 8 for Basin Parameters and Floodrouting results.)

Conclusions and Recommendations - Hydrographs show that the proposed system of bridges, cross connections and weirs with their retention basins are adequate to handle 25 year storms of the severity and distribution for which they were designed without causing inundation of residential lots. Drawdown times are of reasonable length and should be adequate to protect the residential lots of Cape Coral against additional rainfall during drawdown time.

The following additional considerations were recommended in making water management decisions for the basin:

- (1) Encourage on-site retention should large commercial developments occur in assumed residential areas within the drainage basin.
- (2) If waters from other basins are to be discharged into any canal in Cape Coral, control structures must be constructed to restrict their flow.

(3) If the runoff from the area east of U.S. 41 is increased due to development of the wildlife management area, a flow control structure is recommended upstream of the Cape Coral project for protection against excessive inflows.

(4) Cross connections should continue to be provided where possible to furnish additional drawdown potential for basins with different peak flow times and to promote additional canal flows in general.

(5) When the area bounding Gator Slough on the north is developed, requirements must be established so that the area to be developed has at least the same relative storage capability as the presently platted and developed areas.

II. PERIMETER CANAL CONCEPT

General Considerations - As previously indicated, the urbanization of the Gator Slough Drainage Basin results in peak discharges of rather large quantities of fresh water which are (Plate 9) delivered through the Burnt Store Road (S.R. 765) salinity line. Mindful that the quality and quantity of freshwater runoff from developed uplands is probably the most influential factor in maintenance of a productive marine bay ecosystem, the developer therefore desired to provide an environmentally acceptable method of disposal of urban runoff waters into tidewater. Direct channelization of upland runoff directly into the bay would result in large bubble shaped areas at the mouth of each canal where the salinity would be too low to support the natural biomass. During times of peak discharge, up to 4,300 cfs of fresh, nutrient laden runoff would have been discharged into the bay at mouth of a canal. This runoff which had not been previously scrubbed of nutrients would not be assimilated by the existing natural ecosystem resulting in the disruption of portions of Matlacha Pass. Development of the perimeter canal was as follows (Plate 10):

Existing Considerations - The eastern shoreline of the Matlacha Pass project area is dominated by shallow bays, marshes and coves - in the south, while in the northern area a steeper, exposed shoreline exists. The average depth of the smaller bays from one-tenth - two feet while the depth of the larger bays is approximately three feet. The smaller bays are predominantly fine sediments on the bottoms while the larger bays have a coarser sand fraction.

The islets and coastal marshes cover a coastal area of 3,200 acres populated by various types of mangroves. The islands are mostly covered with red mangroves with black mangroves occupying the central portions of islands at higher elevations. The shoreline forests contain red, black, and white mangroves. Red mangroves predominate along the lower tidal creeks and sloughs, then merge into black mangroves with the white mangroves occupying the higher elevations.

The bays have the largest biomass of any areas of this system. The bottom vegetation consists of Cuban shoal weed (*Diplanthera*) accompanied with varying quantities of red algae. Many benthic animals are located in the grasses such as gastropods, grass shrimp, crabs, polychaetes, and crustaceans. Nearshore the vegetation gives way to areas of fine silts, sand and muck. In the mud flats, deposit-feeding polychaetes and lamellibranchs are more dominant.

Within the Bay, a chain of sand shoals parallels the shoreline from Big Dead Creek northward along the shoreline of Charlotte Harbor. The shoals vary in depth from three feet in the south to exposed shoals in the north at low water.

The deeper waters of Matlacha Pass vary in depth from six to more than ten feet. The vegetation is again the *Diplanthera* - Algae and sea lettuce, which disappear below the three foot depth. The benthic animals down to three feet in depth consist of brittlestars, small crustaceans, molluscs, and sea squirts. Below three feet in depth, sea squirts, bryozoans, and sand dollars are found. The more mobile upper tropic level organisms flourish in the deeper waters.

Matlacha Pass and Charlotte Harbor are an important sport and commercial fishery area. This area is the largest producer of seatrout and an important producer of mullet. Other commercially important species are mackerel, snapper, pompano, bluefish, grouper, and blue crab. Oyster leases are also located in Charlotte Harbor and Matlacha Pass.

Sport fishing is important to this area, drawing people from the entire State. Important sport fish are red drum, snook and Spanish mackerel. Bottle nose dolphin are also seen in the deeper bays.

This area supports one of the State's largest water fowl populations. During winter months up to 300,000 birds reside there; roosting on the mangrove islands and feeding on the extensive grass flats. Some of the birds observed are bald eagle, osprey, wood stork, snowy egret, white ibis, Louisiana heron, roseate spoonbill, pintail duck, and Florida duck. Also found in the area are the usual water associated birds such as brown pelican, white pelican, gulls, terns, and various shore birds.

The adjacent waters have been established as the Matlacha Pass Aquatic Preserve (G-12), a biological preserve, designed to protect the highly productive area in Matlacha Pass, between Charlotte Harbor and San Carlos Bay. Its establishment was based on the fact that the area is easily one of the most valuable marine habitats in the State.

The water of Florida is classified according to its usage in five major classifications:

- Class I - Public Water Supplies
- Class II - Shellfish Harvesting
- Class III - Recreation - Propagation and management of fish and wildlife
- Class IV - Agricultural and industrial water supply
- Class V - Navigation, utility and industrial use

The waters of this particular area have been classified as Class II due to the feasible production of large amounts of shellfish. Therefore, it is vital that the upland development induce the least possible detrimental effect on the area.

Tides in the area are classified as mixed and based on recent gage observations, have ranges as follows:

	Charlotte Harbor <u>North End of Project</u>	Matlacha <u>South End of Project</u>
Diurnal Range-	1.8 feet	1.9 feet
Mean Range-	1.1 feet	1.2 feet

Datum planes are as follows, related to mean sea level:

Mean higher high water-	1.22 feet	1.15 feet
Mean high water-	0.99 feet	0.91 feet
Mean low water-	(-) 0.14 feet	(-) 0.30 feet
Mean lower low water-	(-) 0.54 feet	(-) 0.71 feet

The tidal movements in this area are generally in an east and west direction with low velocities except in the tidal channels between the coastal islands. A tidal study has been underway to determine the effects that discharges from the confluence with the Caloosahatchee River and storm rainfall from the adjacent upland. From this study, it was concluded that the rainfall has a smaller effect on the tides than do the river discharges. Discharges from water control structure S-79 on the Caloosahatchee River (10 CFS to 10,000 CFS) cause the height of the high tides to shift toward the Matlacha area while just the opposite is true for low tides.

It is indicated that a tidal node exists in the vicinity of the Matlacha Pass bridge. The high tides at the north end of the proposed waterway occur fifteen (15) minutes before the high tide at Matlacha Pass bridge while the low tides occur thirty-five (35) minutes earlier at the north end. The high tides at a station approximately five (5) miles south of the Matlacha Pass bridge occur fifty-one (51) minutes earlier while the lows occur an hour and six (1:06) minutes earlier.

The low tidal velocities and a tidal node results in longer residence times for tidal waters in the vicinity of Matlacha Pass bridge. The result would be a lens of low salinity water in this vicinity if large quantities of fresh water were introduced into the estuary near Matlacha Pass bridge. This lower salinity water would have a detrimental effect, from a biological viewpoint, on the local benthic organisms as well as the more mobile animals and has been a major design consideration for the perimeter waterway.

The upland vegetation inland of the coastline is the common slash pine-saw palmettos found throughout South Florida. The beach ridge located in the vicinity of the northern end of the proposed waterway is approximately three feet high and is stabilized by sea grape, buttonwood, sable palm, morning glory and salt-tolerant grasses.

The existing upland runoff flows laterally through the grasses and mangroves before entering the bay system. This very low velocity sheet flow allows considerable deposition of silt and organic matter in the area around the mangroves and grasses. The natural vegetation then absorbs the nutrients and organic matter permitting good quality water to flow toward the estuary. As a result, the upland runoff currently enters the Bay in small quantities and of good quality leaving the nearshore ecosystem to thrive in its present equilibrium.

Perimeter Waterway Design - The proposed perimeter waterway was conceived and designed to perform the following functions:

1. Collect the upland runoff.
2. Provide for colloidal sediment deposition prior to reaching the waters of the bay system.
3. Encourage the mixing of fresh and salt waters before reaching the waters of Matlacha Pass.
4. Reestablish and preserve the natural sheet flow to the vegetation zone to the west.
5. Establish a method to permit nutrient removal by natural plant material.
6. Furnish recreational and navigational opportunities for the development residents.
7. Provide a buffer zone between an upland urban development and the extensive mangrove zone which is to be preserved.

The waterway was designed to follow a natural contour: i.e., the western edge of the waterway was meandered along the 1.2 foot Mean Sea Level (MSL) contour (Plate 11). This contour also represents the natural vegetation line between mangroves and the usual upland vegetation. As a positive head builds up in the waterway due to upland runoff, water will be forced over the western edge of the waterway along its entire perimeter. This designed overbank flow action will be similar to the present natural sheet flow through the mangroves.

Oblique and vertical false color infrared photographs coupled with panchromatic aerial photographs and visual (ground truth) observations were used primarily to determine the preliminary design location of the western edge of the perimeter waterway. The infrared photographs provide excellent color variations for vegetation changes. Actual ground elevations were obtained by a representative series of profiles made from the upland westward to elevations lower than 1.0 feet MSL. For actual construction, additional profiles will be made to provide definition for the western limits of the waterway. The eastern limits of the waterway were primarily controlled by urban limits of development areas platted in the mid 1960's.

The proposed perimeter waterway plus the interior canals to the west of Burnt Store Road provide a 1300 acre reservoir to collect the upland runoff. This design will allow the upland runoff to enter the bay in small creep flow quantities rather than the large, concentrated quantities from the usual canal discharges. The smaller quantities over a large frontispiece can be assimilated by the estuarine waters without forming a lens of low salinity water as would result from direct discharge. Thus the perimeter waterway is conceived and designed to allow the predevelopment sheet flow through the mangroves and grasses to be basically reestablished.

Based on other similar work it is believed the impoundments, waterway and the mangroves can assimilate the following quantities of pollutants during a peak 24 hour period:

Protein Nitrogen	23,000 pounds
Inorganic Nitrogen	2,500 pounds
Organic Phosphorous	1,750 pounds

Likewise, the following are the maximum estimated quantities of pollutants expected during a 24 hour period after development occupation:

Protein Nitrogen	3,000 pounds
Organic Phosphorous	9,000 pounds

The perimeter waterway and its associated vegetation toward the receiving water body should assimilate a large portion of the pollutants released from the uplands. Solids and nutrients not absorbed in the waterway will be further assimilated by the mangrove zones and associated vegetation which should normally result in good quality water entering the estuary.

The waterway is designed with an average top width in excess of four hundred feet and a maximum water depth of approximately six (6) feet. The wide top width will allow wind mixing to help prevent stratification. If the waterway was allowed to stratify, then organic material introduced by the upland runoff could form a bottom layer of decaying material resulting in the formation of methane and hydrogen sulfide gases. Then during rains, these gases might be forced to the surface by the colder runoff, thereby releasing these odoriferous gases to the atmosphere. The wind fetch is not expected to be significantly obstructed by single family dwellings predominate in this location. Normally, even low velocity winds will induce turnover.

The shallow design depth will allow light to penetrate to the waterway bottom, providing enough light for plant growth to carry on photosynthesis. The oxygen produced by plant growth along with the wind induced turnover is expected to keep the water aerated, preventing deoxygenation below acceptable levels (i.e. 4.0 ml/l).

The peripheral waterway acts as a wide, shallow settling pond to precipitate solids and absorb nutrients. It should be noted that the numerous upstream weirs will function to pre-screen most of the heavy suspended solids. The waterway biota will exist in an aerobic condition due to wind induced turnover and shallow depth. The aerobic organisms will absorb enough nutrients so that the water entering the grass-mangrove system will be of acceptable quality. The mangroves forest will aid in the disbursement of the water over an area of about 3,200 acres. The flow rate out of the peripheral waterway is equal to the flow rate into the waterway, minus storage. Therefore, the 25-year storm peak flow rate of 12,300 cfs will result in 3.8 cfs of runoff per acre of dispersion area. The mangroves can easily withstand a freshwater runoff of this magnitude without ecological harm.

Since a large portion of the mangroves are inundated by normal tidal waters, the saltwater mixing area within the mangrove zone is greater than 1,000 acres. This results in a maximum mixing of approximately 12 cfs per acre of open water within the mangroves and which is easily assimilated by the estuarine waters without harmful effects.

Hydraulic Considerations - The western edge of the perimeter waterway and the associated sheet flow can in its simplest form be approximated by the Manning's equation: $Q = \frac{W \cdot 1.486}{n} D^{5/3} S^{1/2}$

Where: Q = Discharge in CFS (12,300 CFS)
 W = Width of cross section in feet (40,000 ft.)
 n = Manning's roughness coefficient
 D = Head in feet $\frac{D}{1500}$
 S = Slope of water surface ($\frac{D}{1500}$ ft.)

The resulting heads for various roughness coefficients are tabulated below:

<u>Roughness Coefficient n</u>	<u>Head in Feet D</u>
0.3	2.6
0.5	3.2
0.7	3.8
0.9	4.2
1.1	4.7
1.3	5.0

The expected mean coefficient will be in the 0.3 to 0.5 range for the combination of mangrove and grass vegetations existing. No field observations have been made to determine the actual coefficient at this time. Such investigations will be made upon completion of an initial section of the perimeter waterway.

To prevent erosion of tidal creeks such as Gator Slough and Big Dead Creek by the sheet flow, the western edge of the perimeter waterway will be riprapped across and adjacent to the creeks. Inasmuch as the upper reaches of the drainage basins of these tidal creeks are crossed by the peripheral waterway, some protection is necessary to prevent formation of channels to the bay, thereby reducing the effectiveness of the perimeter waterway.

To provide for navigation to open water, a lock structure will be provided at each end of the waterway (Plate 12). The locks are relatively simple structures designed to be operated by the boat skippers. An automatic mechanism controls the water level and the gates. The water transfer in the lock is by gravity, eliminating pumps for water transfer, however, if dictated by water quality considerations it is possible to modify gravity lock operation to provide for pump operation. In this mode no water discharge is necessary from inside the system to tidal waters through the lock.

To prevent water channelization around the locks, an earthen dike will be constructed along seaward edges of the entrance channel. This construction will not limit the effective length of the waterway, but prevents water from flowing around the lock and into the entrance channel. It will be possible under strict supervision of Pollution Control officials to open the locks to allow tidal flushing of the waterway. Due to the waterway's $\pm 40,000$ feet length and its location with respect to the bay, a small tidal difference exists between the north and south locks. This tidal difference may conceivably be used to flush the waterway during drought conditions. The average amount of lockage water (water lost from the lock during each cycle) for normal gravity operation, ranges from 550 to 1,050 cubic feet, flowing from the waterway to the bay (Plate 13). Since the locks can cycle a maximum of four times an hour, the lockage water discharges at a rate of approximately 1 cfs from each lock if they are used continuously. This is such a small quantity of direct discharge relative to the drainage basin and to the estuary that it can be ignored from an ecological viewpoint.

Navigational channels are provided from the locks to the navigable waters of Matlacha Pass and Charlotte Harbor. The north channel is designed with a bottom width of fifty (50) feet, an elevation of -5.0 feet MLW and will be marked with appropriate channel markers. The south channel is designed with a bottom width of fifty (50) feet and an elevation of -5.0 feet MLW. The -5.0 feet MLW elevation is basically compatible with the depths of Matlacha Pass and will facilitate operation of most pleasure craft less than forty (40) feet in length.

Sheltered marinas are proposed or existing at both ends of the waterway providing for maximum access for recreational boating.

Conclusions

Matlacha Pass and Charlotte Harbor are shallow water ecosystems which would be significantly damaged if upland runoff was allowed to flow directly into the estuarine areas via excavated channels. The developer will combine urban development, recreation, and preservation of sensitive ecological areas through the use of the perimeter waterway.

This waterway will perform important environmental functions in collecting and allowing restricted, biologically screened discharge of the upland runoff. By collecting and restricting the upland runoff until deleterious components can be assimilated by natural vegetation, the perimeter waterway conceivably may improve water quality. The waterway will also act as a physical buffer between the developed and undeveloped areas in addition to being a functioning part of the ecosystem. Through design the west edge of the waterway will maintain simulated sheet flow through the mangroves and grasses. Based on present observations, the mangroves will flourish in the nutrients

and sediments deposited by the runoff, and the net productivity in the life chain cycle is expected to increase.

REFERENCES

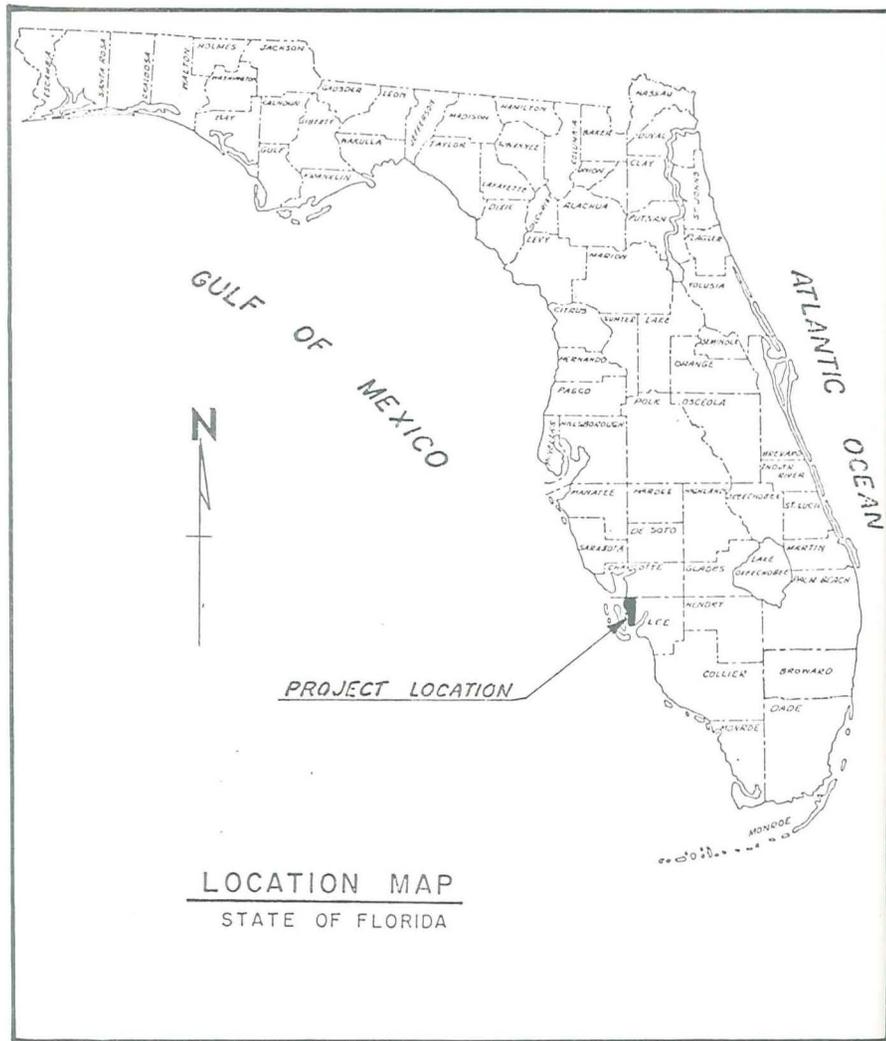
"Hydraulic Study for Gator Slough and Certain Cape Coral Drainage Basins", J. E. Greiner Company, Tampa, Florida - 1973

"A Biological Resource Survey in the Matlacha Pass Area of Pine Island Sound, Lee County, Florida", Dr. Durbin Tabb, et al, Rosenstiel School of Marine and Atmospheric Science, Miami, Florida - 1972

"Computer Program for Project Formulation - Hydrology", U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C. - 1964

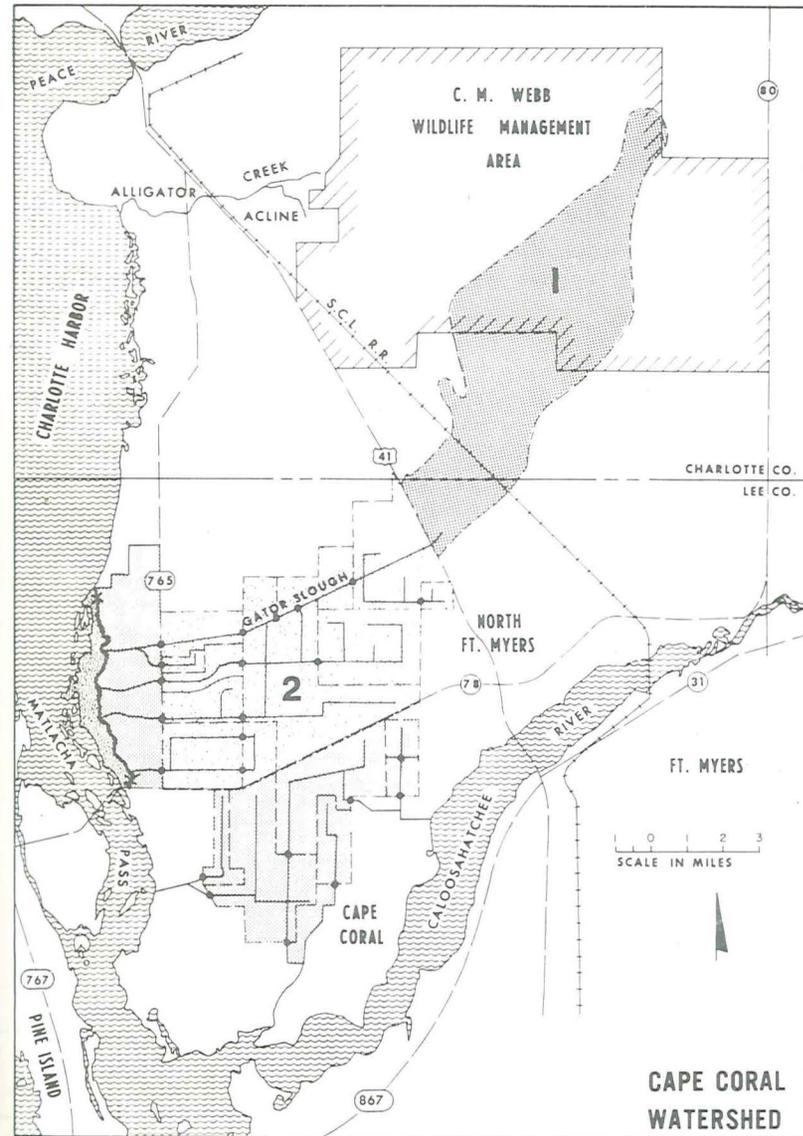
"Flood Plain Information - Charlotte and North Lee Counties", Corps of Engineers, Jacksonville, Florida

"Channel Excavation and Lock Construction - Matlacha Pass, Cape Coral, Lee County, Florida", Gee & Jenson Consulting Engineers, Inc., West Palm Beach, Florida



LOCATION MAP
STATE OF FLORIDA

PLATE NO. 1



CAPE CORAL
WATERSHED

PLATE NO. 2

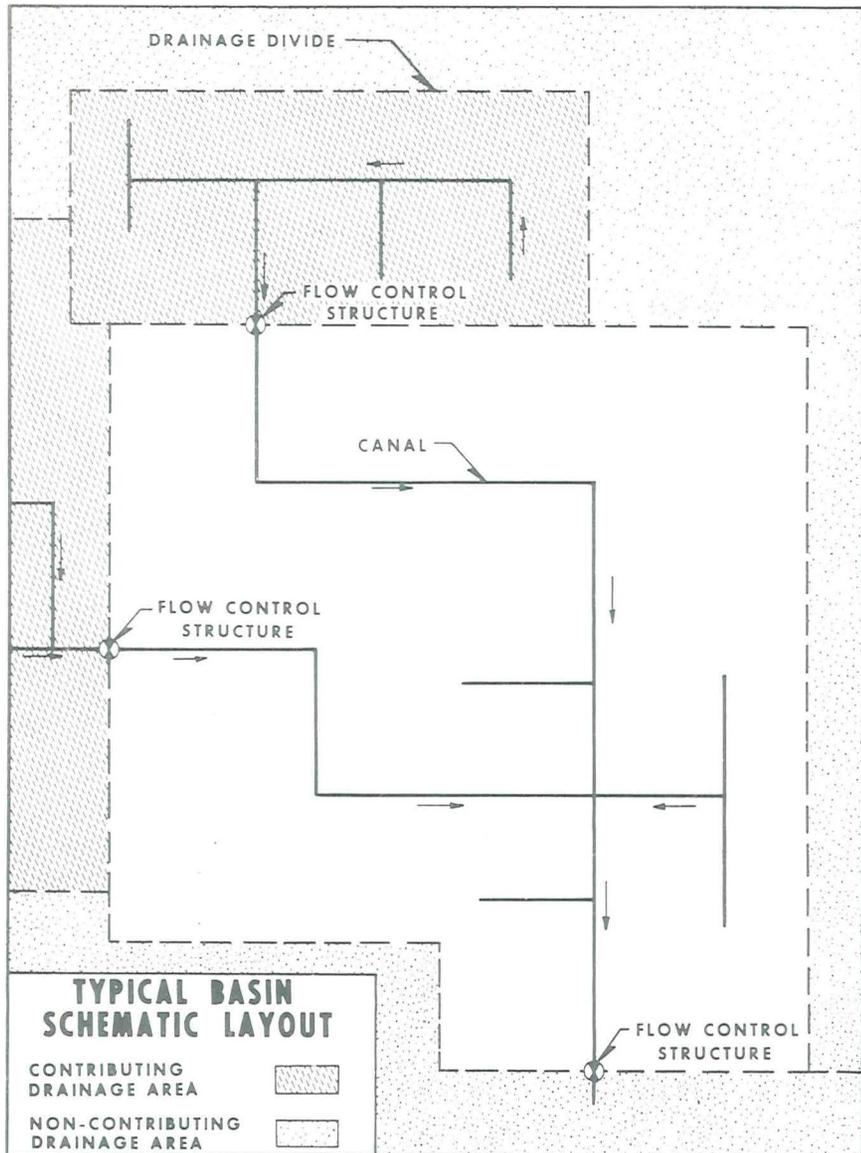


PLATE NO. 3

RAINFALL DEPTH VERSUS RETURN PERIOD

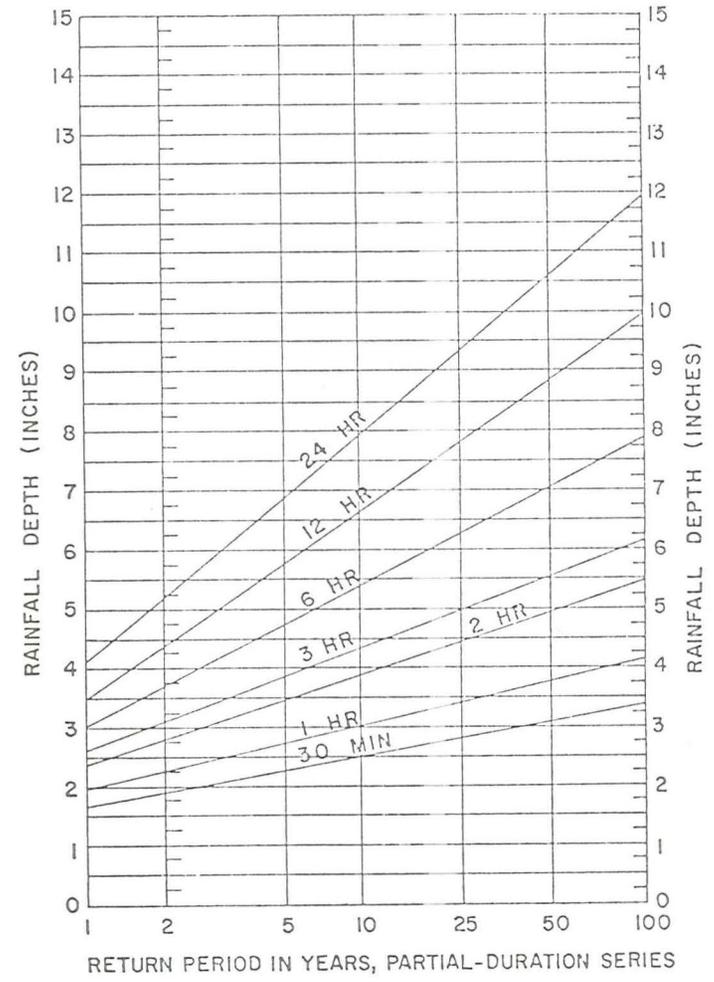
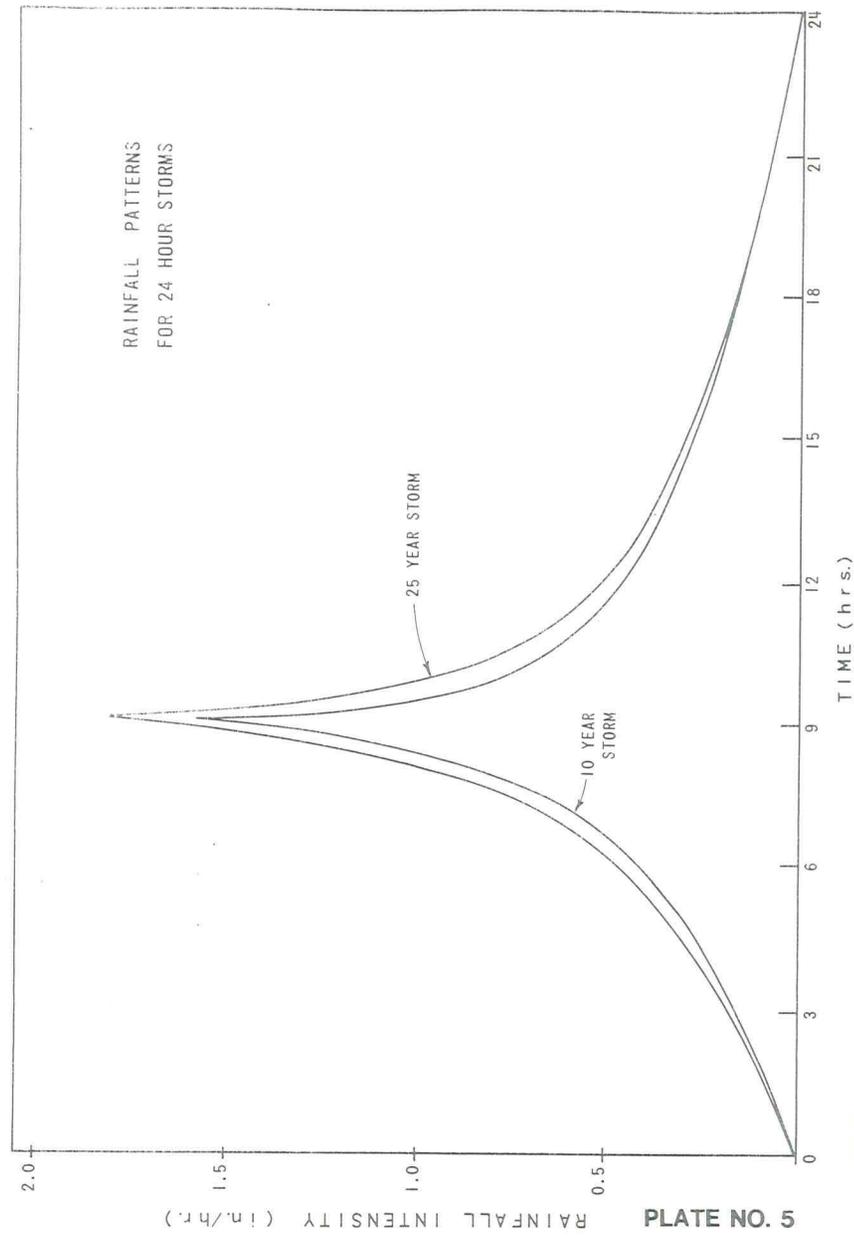
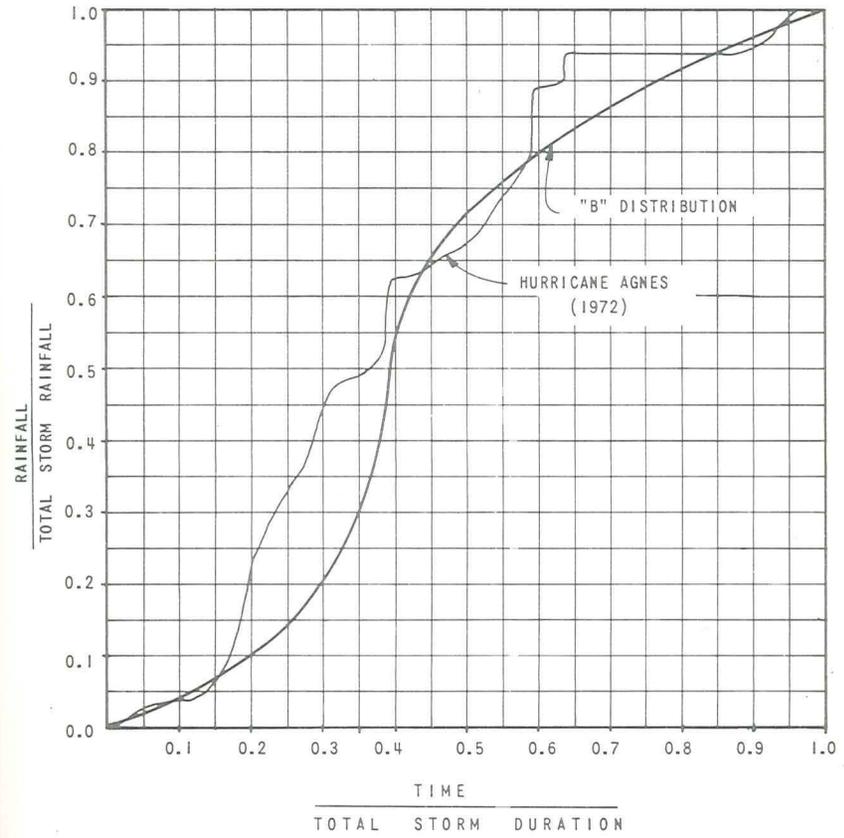


PLATE NO. 4



DIMENSIONLESS STORM DISTRIBUTION CURVES



STORAGE DISCHARGE CURVES

STRUCTURE NUMBER 21

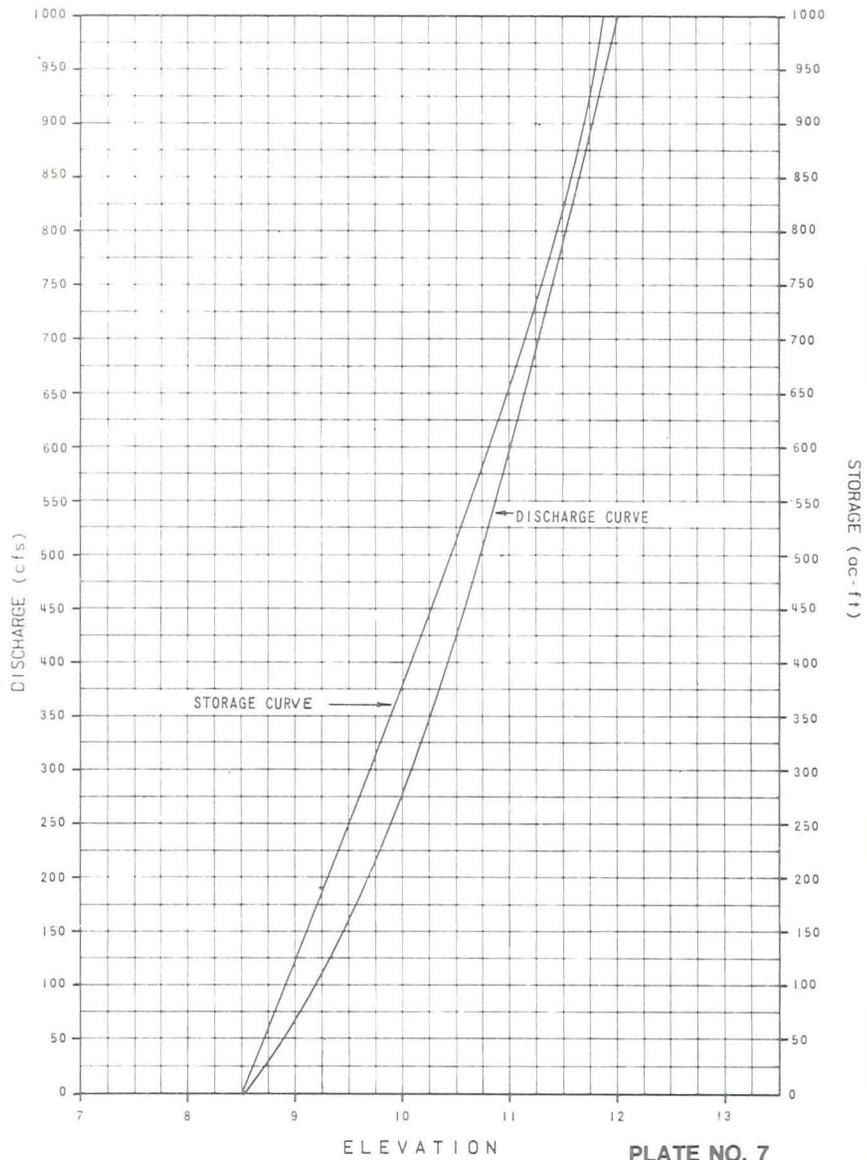


PLATE NO. 7

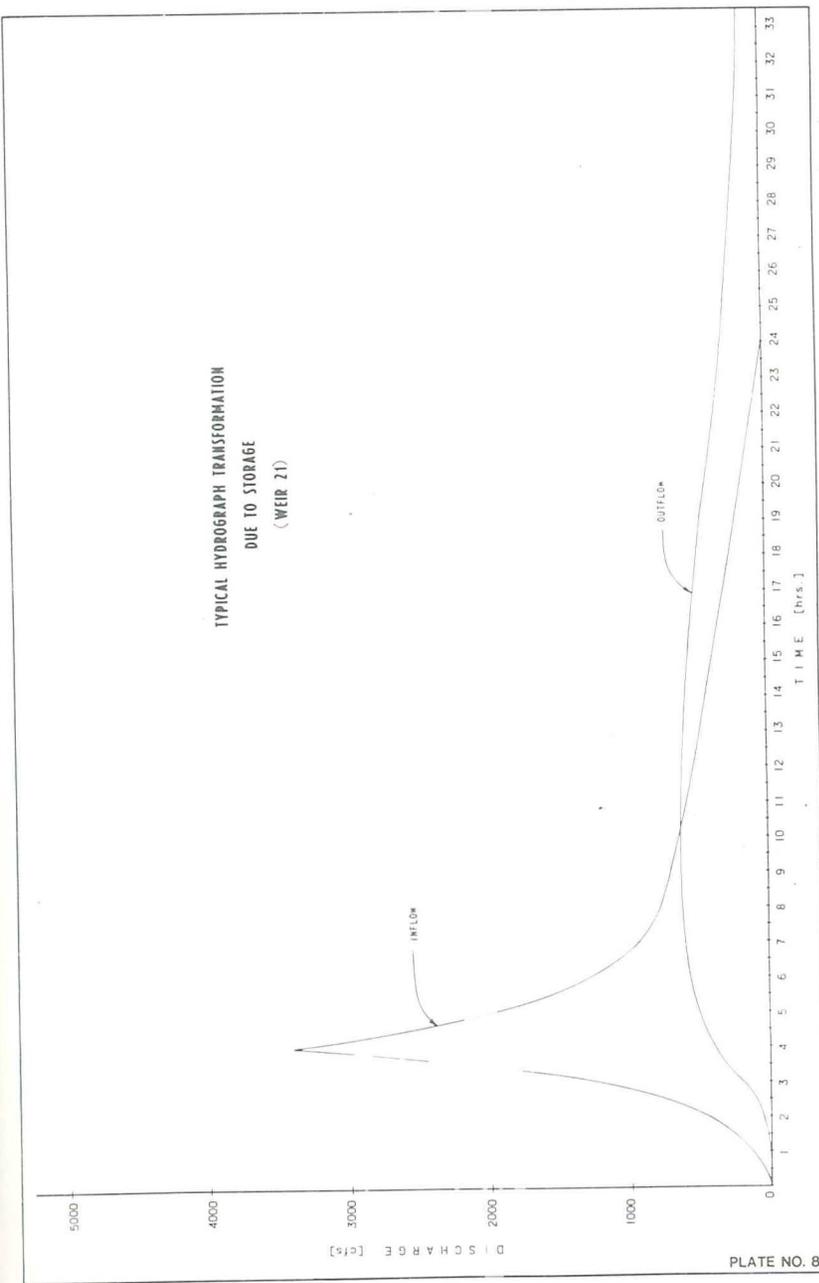


PLATE NO. 8

BASIN PARAMETERS AND 24 HOUR RAINFALL RESULTS

WEIR NO.	WEIR LENGTH (FT.)	CREST ELEV.	DRAINAGE AREA (SQ. MI.)	STORAGE AREA (AC.)	10 YEAR STORM		25 YEAR STORM	
					DISCHARGE	ELEVATION	DISCHARGE	ELEVATION
1								
†2	24	6.0	3.10	188.5	175	7.98	221	8.39
3								
†4	130	6.5	22.84	161.3	2576	9.94	3163	10.27
5								
6								
7								
†8	24	6.0	3.10	188.5	175	7.98	231	8.39
9	130	8.5	44.35	100.0	2748	12.44	3340	13.03
10								
x11	178	2.4	26.35	140.0	2741	5.22	3449	5.68
x12	36	2.4	0.47	6.2	228	3.89	291	4.14
x13	101	2.4	19.87	52.5	1600	5.27	2190	5.95
x14	83	2.4	17.18	76.5	1365	5.35	1788	5.94
x15	99	2.4	5.80	110.1	1701	5.29	2208	5.85
†16	100	6.5	18.27	129.0	1410	9.16	1870	9.71
†17	85	6.5	15.53	109.7	1175	3.14	1544	9.65
18	35	5.0	1.80	50.0	660	8.13	810	8.56
*19	150±	10.5	41.60	230.0	3278	15.2±	3992	15.8±
20								
21	52	8.5	6.0	245.0	604	11.03	773	11.48
22								
23								
24								
58A	55/10	10.5/8.5	See Weir 9		652	12.51	902	13.10
102	16	10.5	1.00	118.0	85	12.02	106	12.36

Basins left blank have not been fully analyzed.

- * Due to submergence additional design length or possible cross-connection upstream of Weir No. 19 must be considered.
- † Storage and drainage areas for weirs of cross-connected basins have been prorated according to weir size.
- x Weirs controlling discharge through burnt store road.

PLATE NO. 9

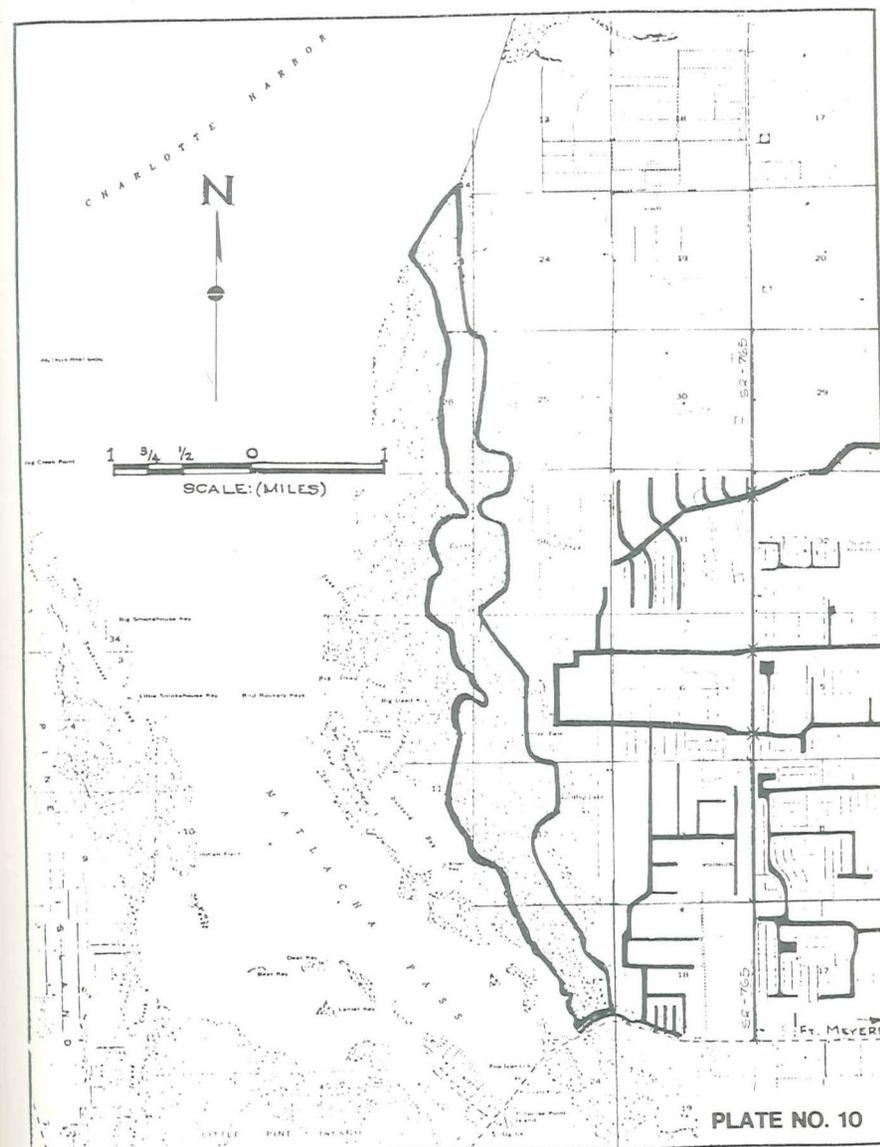


PLATE NO. 10

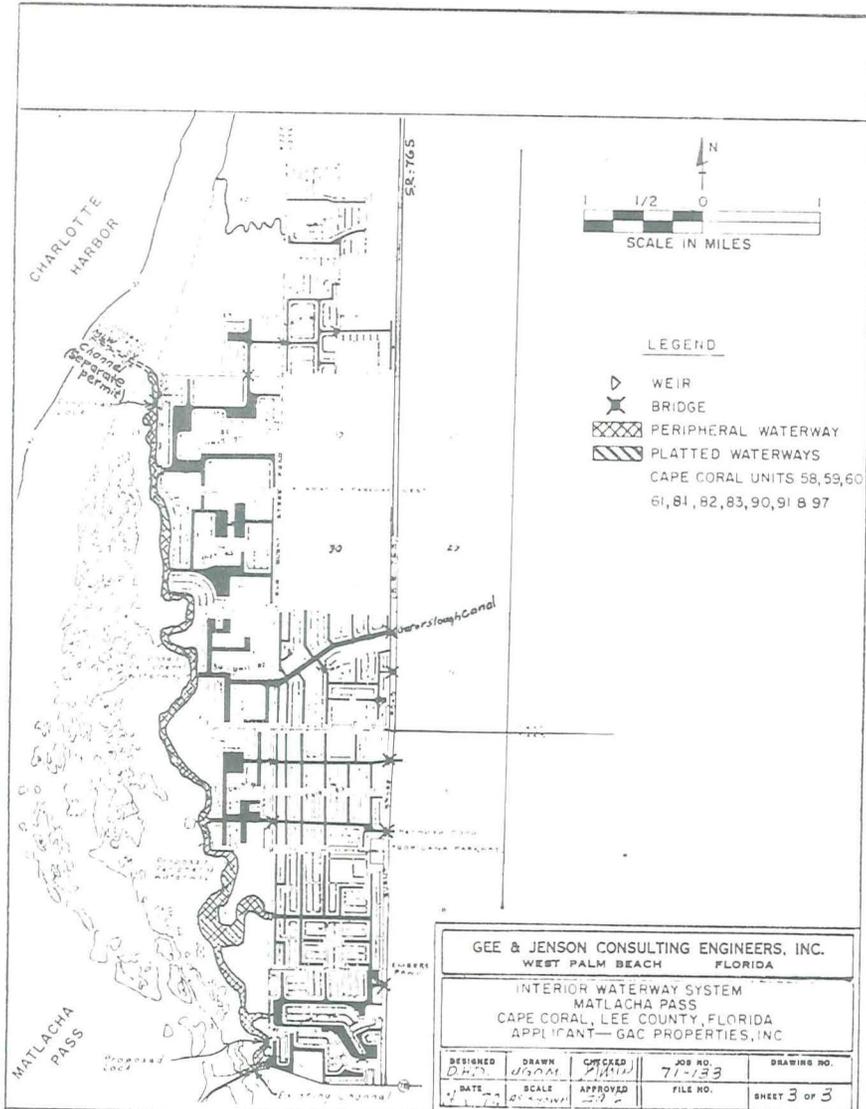


PLATE NO. 11

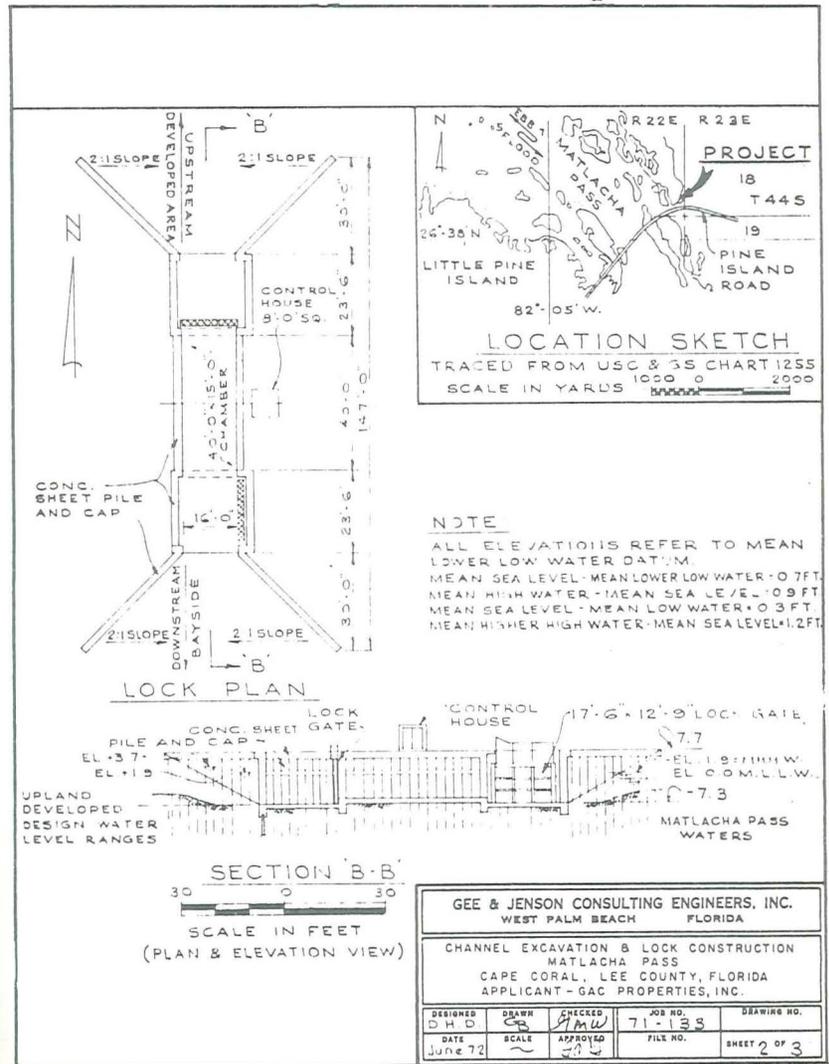


PLATE NO. 12

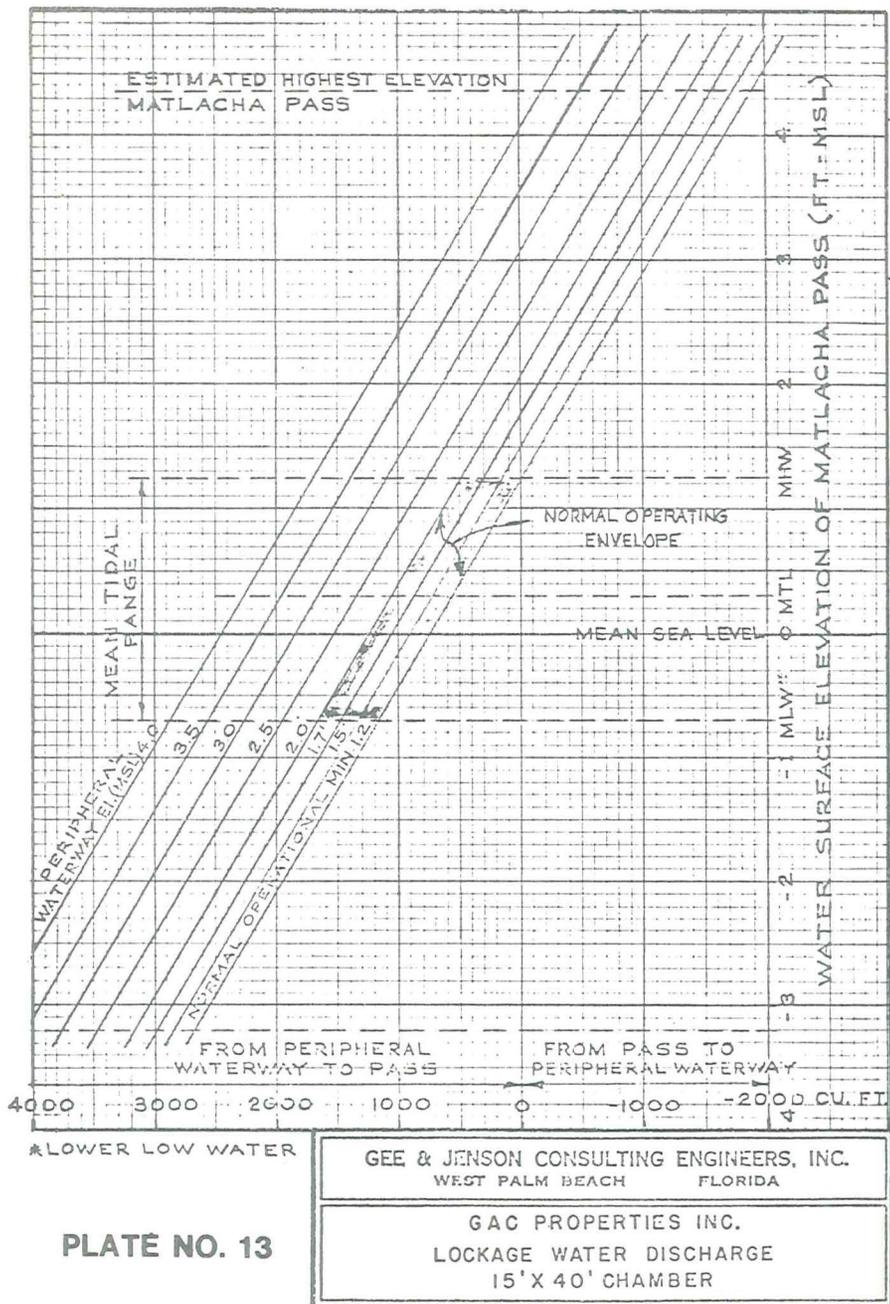


PLATE NO. 13

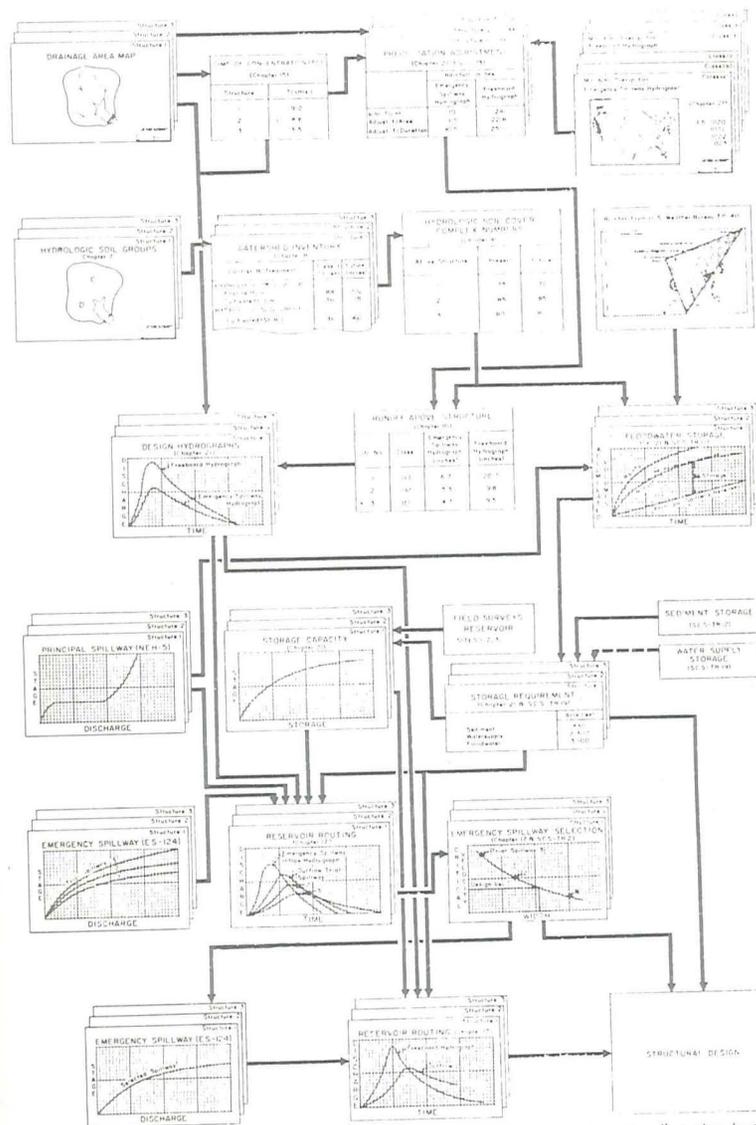


FIGURE 2.3-Design hydrology for storage and spillways in floodwater retarding structures

Xeroxed From: "Soil Conservation Service National Handbook, Section 4, Chapter 1, Hydrology" Dated July 1969.

FIGURE - 1

EXHIBIT 4

WARRANTY DEED

with

RESTRICTIONS ON USE

25.00

THIS INDENTURE made this 12 day of September, 1977 between GAC PROPERTIES INC, a Florida corporation, having its principal place of business in Dade County, Florida and lawfully authorized to transact business in the State of Florida, Grantor, and BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, Grantee.

WITNESSETH: that Grantor, for and in consideration of the sum of \$10.00 and other good and valuable consideration to it in hand paid by the Grantee, the receipt and sufficiency whereof is hereby acknowledged, has granted, bargained and sold to the said Grantee, its successors and assigns forever, all of the land lying waterward of that certain "property line" in the City of Cape Coral, Lee County, Florida, such property line more particularly described and set forth in the "Exhibit" attached and made a part hereof by such reference.

1. (a) In consideration for the within-given grant and conveyance it shall be a covenant running concurrently with the title, such covenant being expressly assumed by Grantee in behalf of itself and its successors and assigns, pursuant to which, Grantee agrees that the land conveyed hereby shall never be developed in any way to provide use for commercial, industrial or residential purposes, nor shall same be used for more than limited public access for purposes of enjoyment of the premises in their natural state.
- (b) For purposes of accomplishing the foregoing limitations, Grantee agrees never to make changes to the surface topography or sub-surface elements through filling of same by deposit of any materials, by excavation, dredging, mining or drilling, to remove any of the soil, vegetation or minerals and petroleum from the premises nor interfering with the natural drainage of the area or using same in a manner contrary to preservation of such lands as part of the wilderness system of the state. Grantee shall take all steps

This Instrument Was Prepared By:
 Robert L. Weintraub
 Attorney at Law
 Post Office Box 523020, Miami, Florida 33152

necessary to include the areas hereby conveyed as a wilderness area under Chapter 258, Florida Statutes.

- (c) At no time shall Grantee allow a use to be made of the premises which shall be inconsistent with preservation of same in accordance with acceptable principles of environmental conservation and shall retain the property's natural character and quality. This limitation is intended to preclude any operations for profit or commercial development and also to limit the building of any structures or improvements from adjacent property which may be inconsistent with limited use, access, or enjoyment in the public.
- (d) In the event of violation of any one of the foregoing limitations as to use or adoption of the property, Grantor or its successors and assigns shall have an immediate right to make application to the Circuit Court for Lee County, Florida or to any other court of appropriate jurisdiction, for a declaration of such court confirming said violation and breach of the foregoing covenant and to obtain, upon such determination, an appropriate judgment enforcing this covenant and ordering restoration of the natural conditions existing prior to any damage occasioned by the violation.
- (e) Failure on the part of Grantor to enforce any alleged violation of the foregoing covenant shall never be construed as a waiver at any subsequent time to declare such violation or others as operative and to commence proceedings as aforesaid.
- (f) Grantor shall have the right to enforce restrictions on the premises to the result that the premises shall always remain in their natural state, or in the event of violation thereof, Grantor may commence proceedings to effect reversion of title to Grantor in a court of appropriate jurisdiction upon proper notice to Grantee of the pendency of such proceedings. No reversion of title shall become operative if within 90 days Grantee shall, after receiving such notice, commence

proceedings to correct the violation and shall have a reasonable time to complete such proceedings successfully. If reverter of title shall occur, then Grantor so reacquiring title shall also be bound to maintain said premises in their natural state and the Grantor agrees that it will take such reacquired title subject to all conditions contained in this conveyance. None of the foregoing shall apply to any of the conveyed premises which might be within one hundred feet (100') on either side of the center line of State Road 78, commonly known as Pine Island Road.

2. Grantee acknowledges that Grantor is in the process of constructing a certain peripheral spreader waterway designated as "A" on Exhibit along the westerly and southerly portions of its properties in the City of Cape Coral, the purpose of which is for the collection of surface runoff waters from the interior canal system lying within said Cape Coral Subdivision owned and developed by Grantor. Such waterway, in the collection of said runoff waters, is designed to allow for a disposal of the excess waters so collected over and across the most westerly or southerly banks thereof onto the lands herein conveyed which lie waterward of such water. The construction of all the foregoing spreader waterway is authorized by the Department of Environmental Regulation and other regulatory agencies, and the operation thereof in the collection and disposal of such waters requires that same be allowed to flow toward navigable waters and across the lands herein conveyed; wherefore:

- (a) Grantor specifically reserves the right unto itself and its successors and assigns to allow uninterrupted surface runoff of waters originating on its lands lying upland of the property line, described in the attached Exhibit, to flow across the lands herein granted and conveyed, and by such reservation Grantee acknowledges an easement in gross for such surface water discharge across such lands.

(b) To the extent reasonably necessary for Grantor to construct, or maintain after construction, the aforesaid spreader waterway, Grantor reserves a right to enter onto portions of the lands hereby conveyed to accomplish such purposes without such entry constituting a trespass of any kind. Such rights of entry include the rights to use access of the subject lands at any time hereafter to accomplish any necessary or needful restoration work on dikes, spoil piles or other limited work required for such purposes. Grantor agrees to restore to natural condition any damage caused by the above work.

3. Subject to conditions, limitations and reservations of record and taxes for the current and subsequent years.

AND the said Grantor, GAC PROPERTIES INC, does hereby fully warrant the title to said land and will defend the same against the lawful claims of all persons whatsoever.

IN WITNESS WHEREOF the said Grantor has caused these presents to sign in its name by its proper officer and its corporate seal to be affixed on the day and year first above written.

GAC PROPERTIES INC

(Corporate Seal)

By: Norman S. Edelcup
President

Frank J. Callahan
Frank J. Callahan, Trustee

Herbert S. Freehling
Herbert S. Freehling, Trustee

STATE OF FLORIDA

COUNTY OF DADE

I hereby certify that on this day, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Norman S. Edelcup well known to me to be the President of the corporation named as Grantor in the foregoing deed, and acknowledged executing the same freely and voluntarily under authority duly vested in him by said corporation and that the seal affixed thereto is the true corporate seal of said corporation.

Witness my hand and official seal in the County and State last aforesaid this 12th day of April, 1977.

Patricia R. Reed
Notary Public, My Commission Expires:

STATE OF FLORIDA

COUNTY OF DADE

NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES APRIL 17 1980
BONDED THRU GENERAL INS. UNDERWRITERS

I hereby certify that on this day, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Frank J. Callahan, well known to me to be the Co-Trustee of the corporation named as Grantor in the foregoing deed, and acknowledged executing the same freely and voluntarily under authority duly vested in him by said corporation and that the seal affixed thereto is the true corporate seal of said corporation.

Witness my hand and official seal in the County and State aforesaid this 13th day of April, 1977.

Patricia R. Reed
Notary Public, My Commission Expires:

STATE OF FLORIDA

COUNTY OF DADE

NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES APRIL 17 1980
BONDED THRU GENERAL INS. UNDERWRITERS

I hereby certify that on this day, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared Herbert S. Freehling, well known to me to be the Co-Trustee of the corporation named as Grantor in the foregoing deed, and acknowledged executing the same freely and voluntarily under authority duly vested in him by said corporation and that the seal affixed thereto is the true corporate seal of said corporation.

Witness my hand and official seal in the County and State last aforesaid this

12th day of April, 1977.
NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES APRIL 17 1980
BONDED THRU GENERAL INS. UNDERWRITERS

Patricia R. Reed
Notary Public, My Commission Expires:

2154 JOHNSON STREET
TELEPHONE (904) 334-0916
FORT O. FILE BOX 1243
FORT MYERS, FLORIDA
33907

February 11, 1977

CARL E. JOHNSON
1910-1929

DESCRIPTION
NEW PROPERTY LINE
ALONG EASTERLY SIDE OF LAND
BEING CONVEYED BY CAC PROPERTIES, INC.
TO STATE OF FLORIDA
SECTIONS 24, 25 & 36, T. 43 S., R. 22 E.
AND
SECTIONS 1, 12 & 13, T. 44 S., R. 22 E.
CITY OF CAPE CORAL, LEE COUNTY, FLORIDA

A line running through Section 24, 25 & 36, Township 43 South, Range 22 East and Sections 1, 12 & 13, Township 44 South, Range 22 East, City of Cape Coral, Lee County, Florida said line being more particularly bounded and described as follows:

From the north quarter corner of said Section 24, Township 43 South, Range 22 East go on a bearing N 89° 47' 56" W along said north line of said section a distance of 1780.00 feet to the Point of Beginning of the herein described line.

From said Point of Beginning, which point is on the north boundary of "Cape Coral Unit 90" as recorded in Plat Book 24 at pages 12 through 29 of the Lee County public records, run through said Unit 90 the following course and distances:

S 00° 49' 11" W for 794.99 feet; N 89° 47' 56" W for 899.24 feet to a point on the west line of said Section 24 and the west line of said Unit 90; thence run along said line S 00° 51' 34" W for 620.01 feet; thence leaving said section line run S 89° 47' 56" E for 495.02 feet; S 00° 51' 34" W for 120.00 feet; S 89° 47' 56" E for 589.74 feet; S 00° 49' 11" W for 852.73 feet; N 89° 26' 00" W for 590.30 feet; S 00° 51' 34" W for 1601.09 feet; S 6° 47' 42" E for 412.32 feet; S 00° 49' 11" W for 744.99 feet to the south line of said Unit 90 and the north line of "Cape Coral Unit 83" as recorded in Plat Book 23, page 41 through 54 of the Lee County public records; thence continue along said line through said Unit 83 the following courses and distances: S 13° 27' 59" E for 103.08 feet; S 00° 49' 11" W for 1955.82 feet; S 89° 23' 00" E for 770.00 feet; S 00° 49' 11" W for 2135.00 feet; S 89° 23' 00" E for 1001.05 feet to a point on a curve not tangent to the last mentioned course; thence run along the arc of said curve having a radius of 1255.00 feet, a central angle of

26° 39' 42", for an arc length of 583.99 feet, said curve having a long chord bearing S 26° 51' 00" E and a length of 578.74 feet, to a point on said curve not tangent to the next mentioned course; thence continue along said line S 00° 49' 11" W for 501.50 feet; thence continue along said line passing from said Unit 83 into "Cape Coral Unit 82" as recorded in Plat Book 24 at pages 113 through 126 of the Lee County public records the following courses and distances: S 26° 34' 35" W for 617.29 feet; S 00° 37' 00" W for 2020.00 feet;

PRESIDENT
ARCHIE T. GRANT, JR.
VICE-PRESIDENT
FORREST H. BANKS
SECRETARY-TREASURER
LEIF E. JOHNSON
ASSOCIATES
LESTER L. BULSON
ROBERT S. O'BRIEN
DAN W. DICKEY
DEAN C. THOMAS
JOSEPH W. EBNER

JOHNSON ENGINEERING, INC.

New Property Line
GAC to State of Florida
24/25/36-43-22 & 1/12/13-44-22

Page 2
February 11, 1977

S 64° 50' 37" E for 444.82 feet; S 89° 22' 20" E for 955.98 feet; S 48° 27' 23" E for 755.77 feet; S 89° 22' 22" E for 761.06 feet; S 00° 02' 45" E for 565.00 feet; N 89° 19' 15" W for 2364.22 feet; S 00° 42' 00" W for 1665.84 feet; and S 89° 18' 00" E for 15.00 feet; thence continue along said line passing from said Unit 82 into "Cape Coral Unit 81" as recorded in Plat Book 24 at pages 102 through 112 of the Lee County public records the following courses and distances: S 00° 34' 51" W for 375.00 feet; S 89° 18' 00" E for 1235.00 feet; S 00° 34' 51" W for 545.00 feet; S 2° 16' 27" E for 185.25 feet; S 00° 34' 51" W for 803.09 feet; N 89° 25' 09" W for 749.22 feet; S 00° 34' 51" W for 2437.83 feet; S 89° 25' 09" E for 1100.02 feet; S 00° 34' 51" W for 1085.01 feet; thence continue along said line running from said Unit 81 into unsubdivided lands the following courses and distances: S 00° 34' 51" W for 375.00 feet; S 89° 25' 09" E for 449.20 feet; S 00° 34' 51" W for 5052.84 feet; S 00° 01' 25" E for 942.11 feet to a point of curve; thence run along the arc of a curve to the left having a radius of 200.00 feet, a central angle of 76° 59' 42", for an arc length of 268.76 feet to a point of compound curvature; thence run along the arc of a curve to the right having a radius of 200.00 feet having a central angle of 76° 59' 42", for an arc length of 268.76 feet to a point of tangency; thence continue along said line S 00° 01' 25" E for 1500 feet more or less to the end of said line located on the southwesterly side of a waterway and said point lying S 48° 31' 56" W for 566.94 feet from a Permanent Reference Monument located at the westerly end of the division line between Lots 24 and 25 in Block 5318 as shown on "Cape Coral Unit 58" as recorded in Plat Book 23, pages 128 through 147 of the Lee County Public Records.

ROB/ds

APR 28 9 55 AM '78
LEE COUNTY PUBLIC RECORDS
OFFICIAL
RECORDS VERIFIED

LEE COUNTY
PUBLIC RECORDS

EXHIBIT 5

An official website of the United States government.

We've made some changes to EPA.gov. If the information you are looking for is not here, you may be able to find it on the EPA Web Archive or the January 19, 2017 Web Snapshot.

Close



MEMORANDUM OF AGREEMENT

Between The Department of the Army and The Environmental Protection Agency

THE DETERMINATION OF MITIGATION UNDER THE CLEAN WATER ACT SECTION 404(b)(1) GUIDELINES

Portions of this MOA that concern the type and location of compensatory mitigation are superseded by the 2008 compensatory mitigation rulemaking

I. PURPOSE

The United States Environmental Protection Agency (EPA) and the United States Department of the Army (Army) hereby articulate the policy and procedures to be used in the determination of the type and level of mitigation necessary to demonstrate compliance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines ("Guidelines"). This Memorandum of Agreement (MOA) expresses the explicit intent of the Army and EPA to implement the objective of the CWA to restore and maintain the chemical, physical and biological integrity of the Nation's waters, including wetlands. This MOA is specifically limited to the Section 404 Regulatory Program and is written to provide guidance for agency field personnel on the type and level of mitigation which demonstrates compliance with requirements in the Guidelines. The policies and procedures discussed herein are consistent with current Section 404 regulatory practices and are provided in response to questions that have been raised about how the Guidelines are implemented. The MOA does not change the substantive requirements of the Guidelines. It is intended to provide guidance regarding the exercise of discretion under the Guidelines.

Although the Guidelines are clearly applicable to all discharges of dredged or fill material, including general permits and Corps of Engineers (Corps) civil works projects, this MOA focuses on standard permits (33 CFR 325(b)(1)).¹ This focus is intended solely to reflect the unique procedural aspects associated with the review of standard permits, and does not obviate the need for other regulated activities to comply fully with the Guidelines. EPA and Army will seek to develop supplemental guidance for other regulated activities consistent with the policies and principles established in this document.

This MOA provides guidance to Corps and EPA personnel for implementing the Guidelines and must be adhered to when considering mitigation requirements for standard permit applications. The Corps will use this MOA when making its

determinations of compliance with the Guidelines with respect to mitigation for standard permit applications. EPA will use this MOA in developing its position on compliance with the Guidelines for proposed discharges and will reflect this MOA when commenting on standard permit applications.

II. POLICY

A. The Council on Environmental Quality (CEQ) has defined mitigation in its regulations at 40 CFR 1508.20 to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. The Guidelines establish environmental criteria which must be met for activities to be permitted under Section 404.² The type of mitigation enumerated by CEQ are compatible with the requirements of the Guidelines; however, as a practical matter, they can be combined to form three general types: avoidance, minimization and compensatory mitigation. The remainder of this MOA will speak in terms of these general types of mitigation.

B. The Clean Water Act and the Guidelines set forth a goal of restoring and maintaining existing aquatic resources. The Corps will strive to avoid adverse impacts and offset unavoidable adverse impacts to existing aquatic resources, and for wetlands, will strive to achieve a goal of no overall net loss of values and functions. In focusing the goal on no overall net loss to wetlands only, EPA and Army have explicitly recognized the special significance of the nation's wetlands resources. This special recognition of wetlands resources does not in any manner diminish the value of other waters of the United States, which are often of high value. All waters of the United States, such as streams, rivers, lakes, etc., will be accorded the full measure of protection under the Guidelines, including the requirements for appropriate and practicable mitigation. The determination of what level of mitigation constitutes "appropriate" mitigation is based solely on the values and functions of the aquatic resource that will be impacted. "Practicable" is defined at Section 230.3(q) of the Guidelines.³ However, the level of mitigation determined to be appropriate and practicable under Section 230.10(d) may lead to individual permit decisions which do not fully meet this goal because the mitigation measures necessary to meet this goal are not feasible, not practicable, or would accomplish only inconsequential reductions in impacts. Consequently, it is recognized that no net loss of wetlands functions and values may not be achieved in each and every permit action. However, it remains a goal of the Section 404 regulatory program to contribute to the national goal of no overall net loss of the nation's remaining wetlands base. EPA and Army are committed to working with others through the Administration's interagency task force and other avenues to help achieve this national goal.

C. In evaluating standard Section 404 permit applications, as a practical matter, information on all facets of a project, including potential mitigation, is typically gathered and reviewed at the same time. The Corps, except as indicated below, first makes a determination that potential impact have been avoided to the maximum extent practicable; remaining unavoidable impacts will then be mitigated to the extent appropriate and practicable by requiring steps to minimize impacts, and, finally, compensate for aquatic resource values. This sequence is considered satisfied where the proposed mitigation is in accordance with specific provisions of a Corps and EPA approved comprehensive plan that ensures

compliance with the compensation requirements of the Section 404(b)(1) Guidelines (examples of such comprehensive plans may include Special Area Management Plans, Advanced Identification areas (Section 230.80) and State Coastal Zone Management Plans). It may be appropriate to deviate from the sequence when EPA and the Corps agree the proposed discharge is necessary to avoid environmental harm (e.g. to protect a natural aquatic community from saltwater intrusion, chemical contamination, or other deleterious physical or chemical impacts), or EPA and the Corps agree that the proposed discharge can reasonably be expected to result in environmental gain or insignificant environmental losses.

In determining "appropriate and practicable" measures to offset unavoidable impact, such measures should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes. The Corps will give full consideration to the views of the resource agencies when making this determination.

- 1. Avoidance.**⁴ Section 230.10(a) allows permit issuance for only the least environmentally damaging practicable alternative.⁵ The thrust of this section on alternatives is avoidance of impacts. Section 230.10(a) requires that no discharge shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. In addition, Section 230.10(a)(3) sets forth rebuttable presumptions that 1) alternatives for non-water dependent activities that do not involve special aquatic sites⁶ are available and 2) alternatives that do not involve special aquatic sites have less adverse impact on the aquatic environment. Compensatory mitigation may not be used as a method to reduce environmental impacts in the evaluation of the least environmentally damaging practicable alternatives for the purposes of requirements under Section 230.10(a).
- 2. Minimization.** Section 230.10(d) states that appropriate and practicable steps to minimize the adverse impacts will be required through project modifications and permit conditions. Subpart H of the Guidelines describes several (but not all) means of minimizing impacts of an activity.
- 3. Compensatory Mitigation.** Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. Compensatory actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands) should be undertaken when practicable, in areas adjacent or continuous to the discharge site (on-site compensatory mitigation). If on-site compensatory mitigation is not practicable, off-site compensatory mitigation should be undertaken in the same geographic area if practicable (i.e., in close proximity and, to the extent possible, the same watershed). In determining compensatory mitigation, the functional values lost by the resource to be impacted must be considered. Generally, in-kind compensatory mitigation is preferable to out-of-kind. There is continued uncertainty regarding the success of wetland creation or other habitat development. Therefore, in determining the nature and extent of habitat development of this type, careful consideration should be given to its likelihood of success. Because the likelihood of success is greater and the

impacts to potentially valuable uplands are reduced, restoration should be the first option considered.

In the situation where the Corps is evaluating a project where a permit issued by another agency requires compensatory mitigation, the Corps may consider that mitigation as part of the overall application for purposes of public notice, but avoidance and minimization shall still be sought.

Mitigation banking may be an acceptable form of compensatory mitigation under specific criteria designed to ensure an environmentally successful bank. Where a mitigation bank has been approved by EPA and the Corps for purposes of providing compensatory mitigation for specific identified projects, use of that mitigation bank for those particular projects is considered as meeting the objective of Section II.C.3 of this MOA, regardless of the practicability of other forms of compensatory mitigation. Additional guidance on mitigation banking will be provided. Simple purchase or "preservation" of existing wetlands resources may in only exceptional circumstances be accepted as compensatory mitigation. EPA and Army will develop specific guidance for preservation in the context of compensatory mitigation at a later date.

III. OTHER PROCEDURES

A. Potential applicants for major projects should be encouraged to arrange preapplication meetings with the Corps and appropriate federal, state, or Indian tribal, and local authorities to determine requirements and documentation required for proposed permit evaluations. As a result of such meetings, the applicant often revises a proposal to avoid or minimize adverse impacts after developing an understanding of the Guidelines requirements by which a future Section 404 permit decision will be made, in addition to gaining understanding of other state or tribal, or local requirements. Compliance with other statutes, requirements and reviews, such as NEPA and the Corps public interest review, may not in and of themselves satisfy the requirements prescribed in the Guidelines.

B. In achieving the goals of the CWA, the Corps will strive to avoid adverse impacts and offset unavoidable adverse impacts to existing aquatic resources. Measures which can accomplish this can be identified only through resource assessments tailored to the site performed by qualified professionals because ecological characteristics of each aquatic site are unique. Functional values should be assessed by applying aquatic site assessment techniques generally recognized by experts in the field and/or the best professional judgment of federal and state agency representatives, provided such assessments fully consider ecological functions included in the Guidelines. The objective of mitigation for unavoidable impacts is to offset environmental losses. Additionally for wetlands, such mitigation should provide, at a minimum, one for one functional replacement (i.e., no net loss of values), with an adequate margin of safety to reflect the expected degree of success associated with the mitigation plan, recognizing that this minimum requirement may not be appropriate and practicable and thus may not be relevant in all cases, as discussed in Section II.B of this MOA.⁷ In the absence of more definitive information on the functions and values of specific wetland sites, a minimum of 1 to 1 acreage replacement may be used as a reasonable surrogate for no net loss of functions and values. However, this ratio may be greater where the functional values of the area being impacted are demonstrably high and the replacement wetlands are of lower functional value or the likelihood of success of the mitigation project is low. Conversely, the ration may be less than

1 to 1 for areas where the functional values associated with the area being impacted are demonstrably low and the likelihood of success associated with the mitigation proposal is high.

C. The Guidelines are the environmental standards for Section 404 permit issuance under the CWA. Aspects of a proposed project may be affected through a determination of requirements needed to comply with the Guidelines to achieve these CWA environmental goals.

D. Monitoring is an important aspect of mitigation, especially in areas of scientific uncertainty. Monitoring should be directed toward determining whether permit conditions are complied with and whether the purpose intended to be served by the conditions are actually achieved. Any time it is determined that a permittee is in non-compliance with the mitigation requirements of the permit, the Corps will take action in accordance with 33 CFR Part 326. Monitoring should not be required for purposes other than these, although information for other uses may accrue from the monitoring requirements. For projects to be permitted involving mitigation with higher levels of scientific uncertainty, such as some forms of compensatory mitigation, long term monitoring, reporting and potential remedial action should be required. This can be required of the applicant through permit conditions.

E. Mitigation requirements shall be conditions of standard Section 404 permits. Army regulations authorize mitigation requirements to be added as special conditions to an Army permit to satisfy legal requirements (e.g. conditions necessary to satisfy the Guidelines) [33 CFR 325.4(a)]. This ensures legal enforceability of the mitigation conditions and enhances the level of compliance. If the mitigation plan necessary to ensure compliance with the Guidelines is not reasonable implementable, or enforceable, the permit shall be denied.

F. Nothing in this document, is intended to diminish, modify or otherwise affect the statutory or regulatory authorities of the agencies involved. Furthermore, formal policy guidance on or interpretation of this document shall be issued jointly.

G. This MOA shall take effect on February 8, 1990, and will apply to those completed standard permit applications which are received on or after that date. This MOA may be modified or revoked by agreement of both parties, or revoked by either party alone upon six (6) months written notice.

Robert W. Page /s/

Assistant Secretary of the Army, Civil Works
February 6, 1990

LaJuna S. Wilcher /s/

Assistant Administrator for Water, U.S.. Environmental Protection Agency
February 6, 1990

¹ Standard permits are those individual permits which have been processed through application of the Corps public interest review procedures (33 CFR 325) and EPA's Section 404(b)(1) Guidelines, including public notice and receipt of comments. Standard permits do not include letters of permission, regional permits, nationwide permits, or programmatic permits.

²(except where Section 404(b)(2) applies).

³ Section 230.3(q) of the Guidelines reads as follows: " The term practicable means available and capable of being done after taking into consideration *cost, existing technology, and logistics in light of overall project purposes.*" (Emphasis supplied.)

⁴ Avoidance as used in Section 404(b)(1) Guidelines and this MOA does not include compensatory mitigation.

⁵ It is important to recognize that there are circumstances where the impacts of the project are so significant that even if alternatives are not available, the discharge may not be permitted regardless of the compensatory mitigation proposed (40 CFR 230.10(c)).

⁶ Special aquatic sites include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs and riffle pool complexes.

⁷ For example, there are certain areas where, due to hydrological conditions, the technology for restoration or creation of wetlands may not be available at present, or may otherwise be impracticable. In addition, avoidance, minimization, and compensatory mitigation may not be practicable where there is a high proportion of land which is wetlands. EPA and Army, at present, are discussing with representatives of the oil industry, the potential for a program of accelerated rehabilitation of abandoned oil facilities on the North Slope to serve as a vehicle for satisfying necessary compensation requirements.

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