

TECHNICAL MEMORANDUM

September 1984

**INTERIM MODIFICATIONS TO THE FAKA-UNION
CANAL OUTLET SYSTEM**

#187

Resource Planning Department
South Florida Water Management District
West Palm Beach, Florida

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MEMORANDUM REPORT

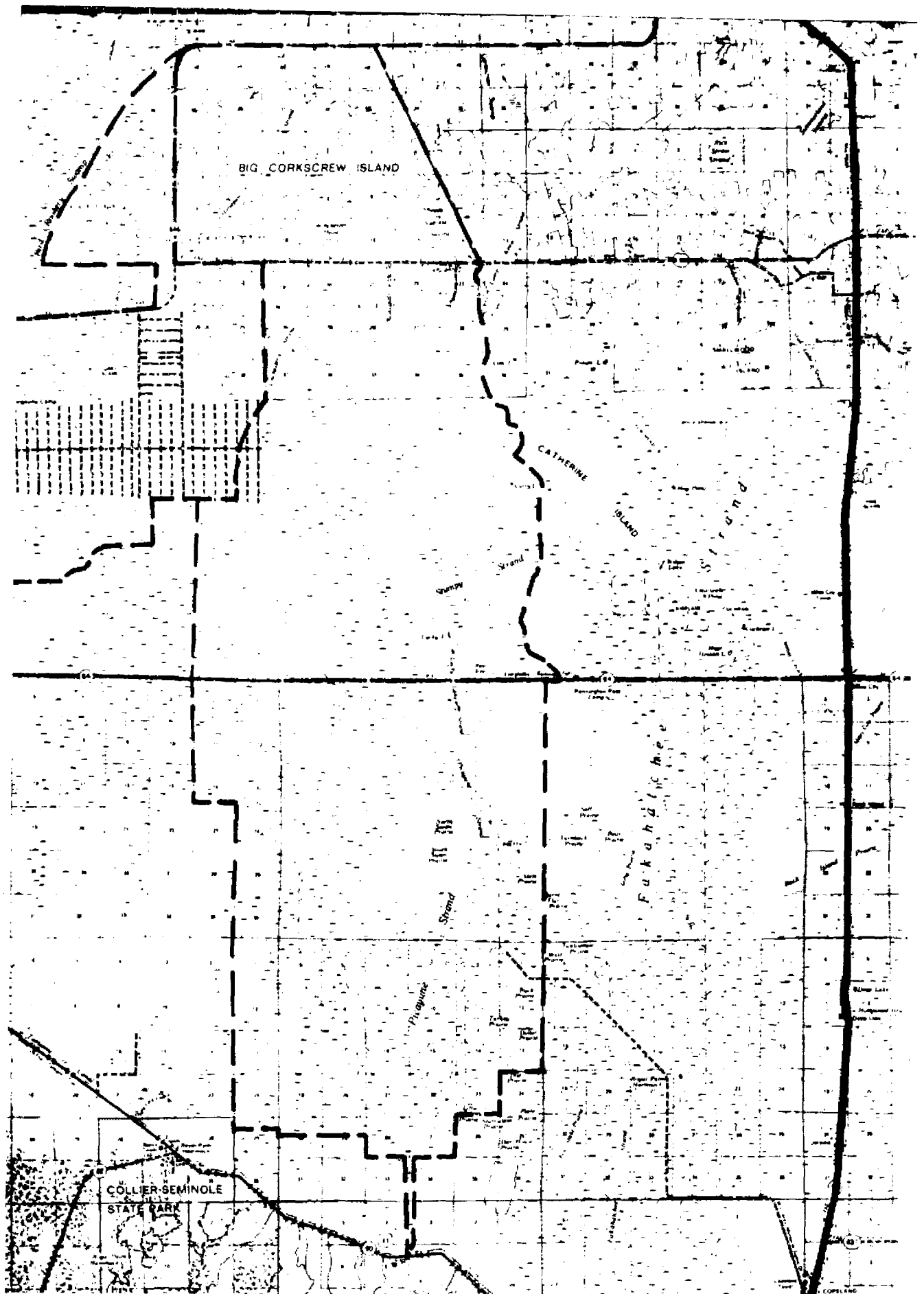
Interim Modifications to the Faka-Union Canal Outlet System

The purpose of this report is to present interim steps that could be taken to ameliorate some of the environmental impacts of the Faka-Union canal discharges on the estuarine system. The longer term solutions will come from the Corps of Engineers study of the overall Golden Gates system. Any interim solutions would not be intended to prejudice the ultimate solution, but should provide integral parts of the final system.

The basic problem component dealt with in this proposal is the concentration of fresh water flows in Faka-Union Bay. This is the result of collecting the flows that formerly entered the estuarine system over a broad front into a single outlet channel. In simplistic terms, this results in too great fluctuations in salinity levels in Faka-Union Bay and too little fresh water input into the surrounding saline areas. Figure 1 shows the configuration of the drainage area and the general location of the basin.

The interim solution consists of diverting flows from the Faka-Union Canal to the north side of Tamiami Trail in the old borrow canal and distributing water through the various bridge openings to the south.

The basis for this preliminary design rests on the initial estimate that the capacity through the bridge openings east of the Faka-Union Canal and the overland flow capacity south of Tamiami Trail is not less than 600 cubic feet per second (cfs). To secure this estimated capacity requires that the old Tamiami borrow be enlarged to provide get-away at the point of release from the Faka-Union. Similarly, a spreader channel will be required along the south side of Tamiami Trail to develop the overland flow capacity and, equally important, to deliver a considerable portion of the flow to estuarine areas east of Faka-Union Bay.



FAKA-UNION CANAL DRAINAGE BASIN

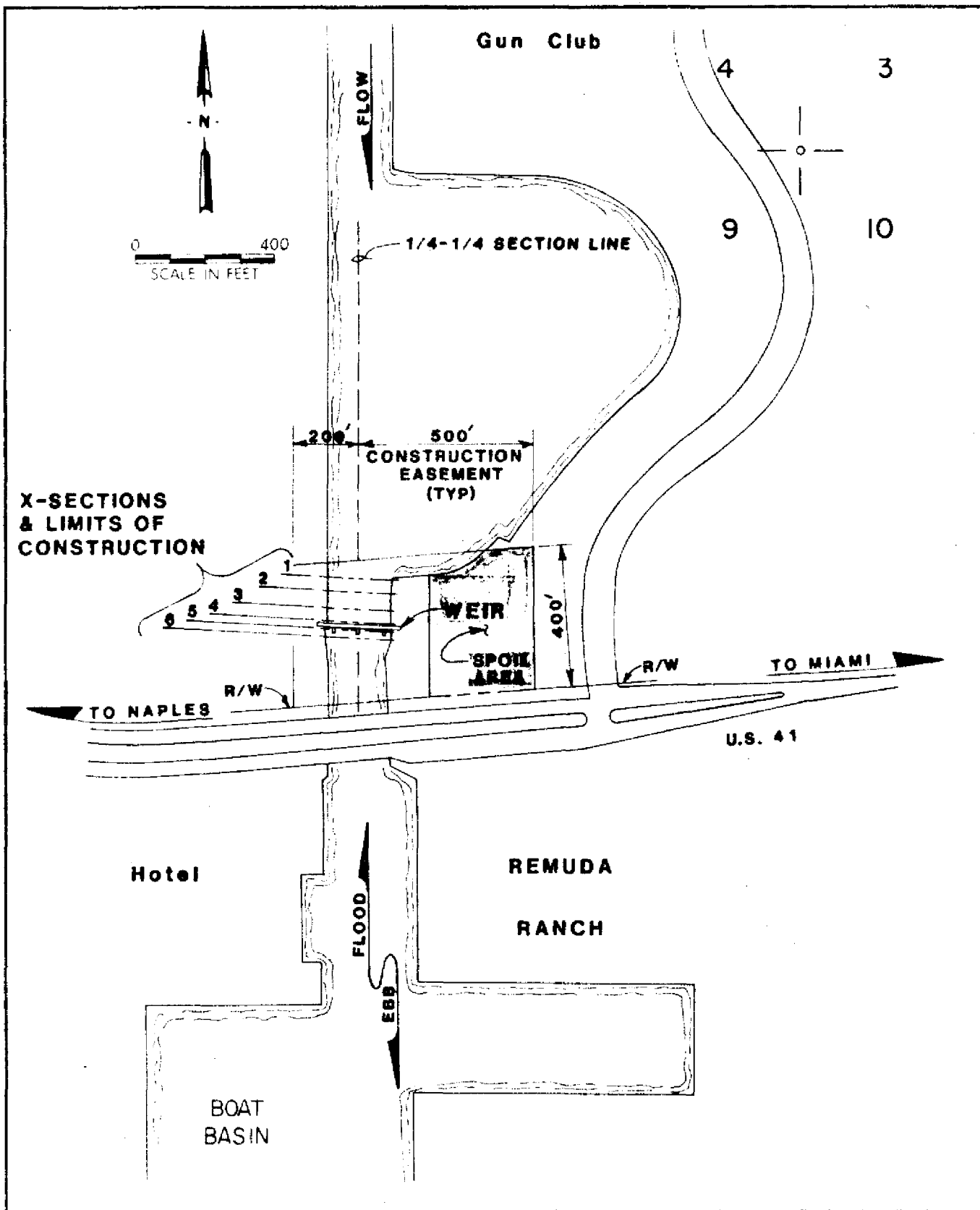
While a similar, or even better, set of physical conditions exists for diverting flows to the west, ownership patterns with many small holdings give little hope of being able to achieve an agreement to implement a program here; at least not in a time frame consistent with a short term project. These considerations place a flow capacity estimate of 150 cfs on the reach of the old Tamiami Canal west of the Faka-Union Canal. No work is included other than the placement of a gated culvert and a connection to the existing borrow channel.

This proposed system will provide a diversion capacity of up to 750 cfs. This would carry the total flow for 90 percent of the time. The maximum storm of record generated a peak flow of 3,190 cfs at a stage of 4.77 feet upstream of the structure. The proposed modification to the structure would not increase the basic crest elevation of 2.0 feet, and the peak stage would reduce somewhat due to the diversion. If needles should be left in the structure during a repetition of this event, an effective crest elevation of 2.5 feet would result in a headwater stage of about 5.1 feet, an effective crest elevation of 3.0 feet would result in a stage of about 5.6 feet.

With a headwater stage of about 4.7 feet, and a discharge rate of 750 cfs, the proposed enlargement of the old borrow to a 30 foot bottom width at -6.0 elevation would deliver the flow at the eastern end of the improvement at an elevation of about 1.5 feet, or approximately one half foot above the ground surface.

The specific components of the proposal are:

- A. Remodel the existing control weir to provide the ability to raise stages above the weir by 1.5 to 2 feet, utilizing removable needles. (Figures 2 & 3 show cross sections and locations near the weir structure in the Faka-Union Canal. Figure 4 shows the construction plans for the existing weir.)



LOCATION MAP

(Project Located in SECT. 9 TWP 52S RGE 28E)
Collier County, Florida

FIGURE 2.

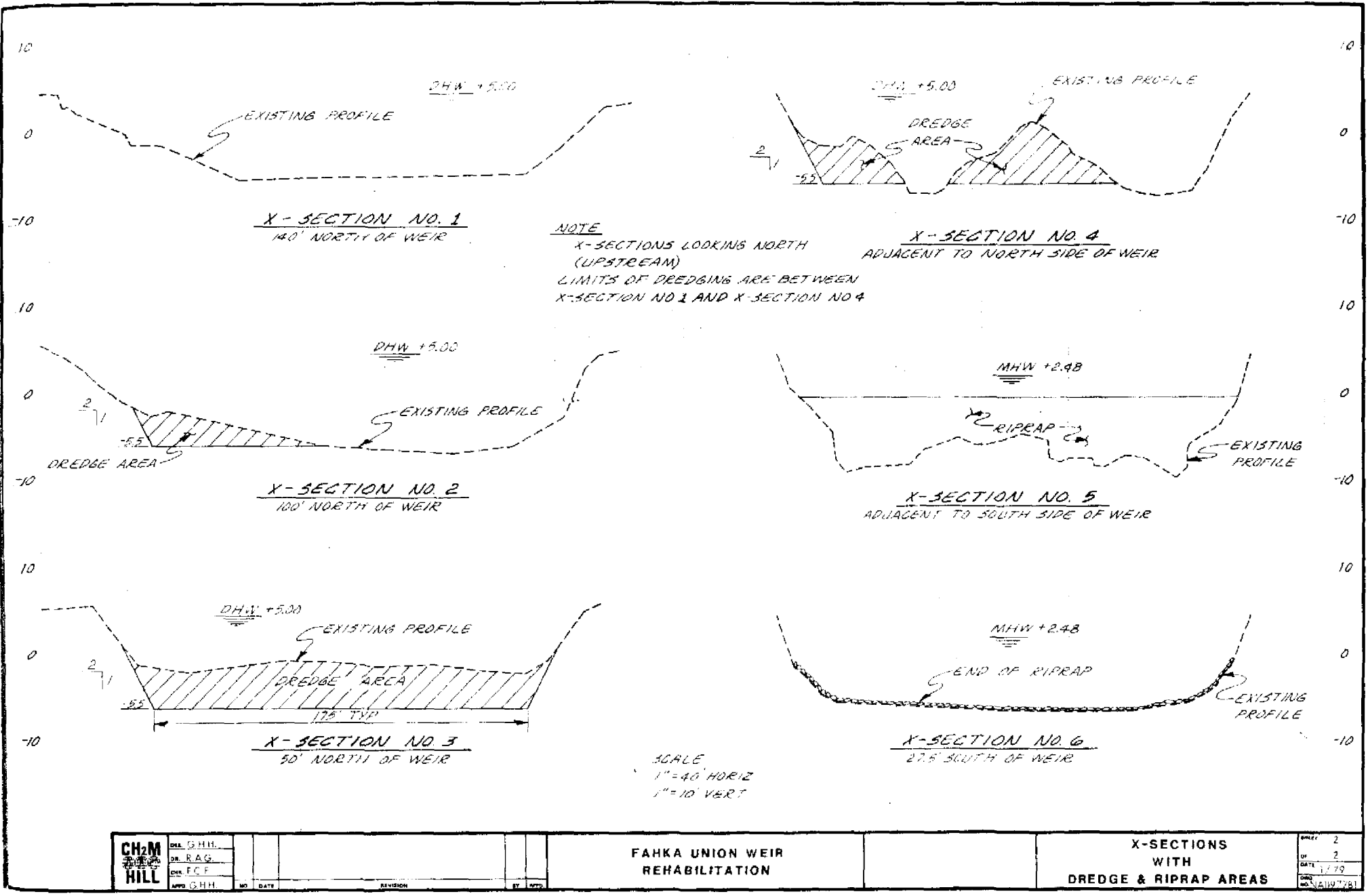


FIGURE 3.

- B. Provide a single 84" gated culvert connection to distribute flows to the west (see Figure 5 for layout).
- C. Provide a double 84" gated culvert connection to distribute flows to the east (see Figure 5 for layout).
- D. Excavate a distribution channel to provide water access from the Faka-Union Canal to the culverts and get-away capacity downstream of the culverts. This would include improvement of the old borrow to the east (see Figure 5 for layout).
- E. Excavate a spreader channel on the south side of Tamiami Canal for the eastern flows (see Figure 5 for layout).

The cost estimate for this proposal is summarized as follows:

(1) Weir structural modification	\$130,000
(2) Single barrel 84" gated culvert structure	65,000
(3) Double barrel 84" gated culvert structure	110,000
(4) Channel excavation (rock)	<u>495,000</u>
Total	\$800,000

This system will permit the diversion of flows for the great majority of conditions. During flood flow peaks, it will be necessary to release down the channel, but otherwise the flows can be balanced as desired between the east, west, and south.

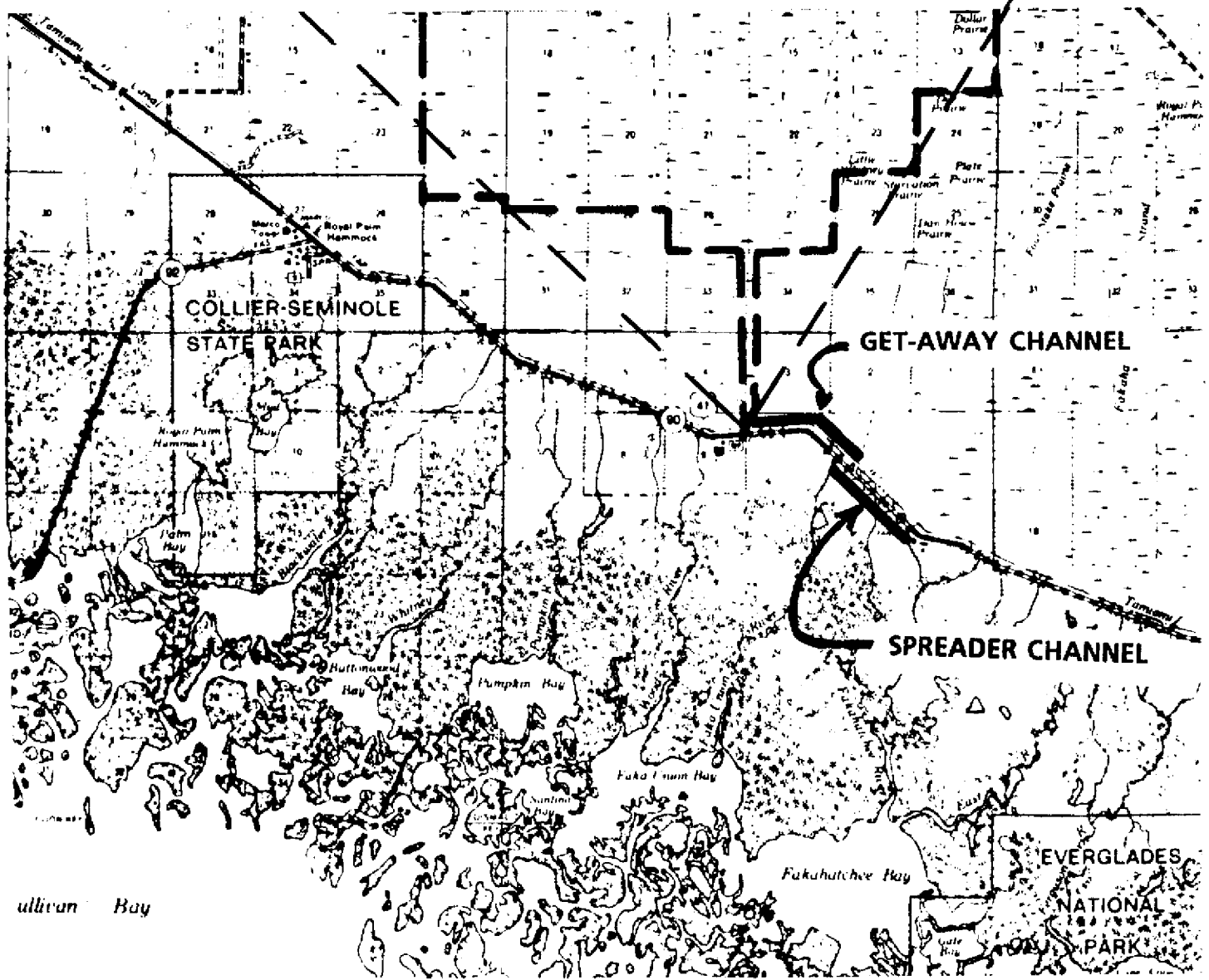
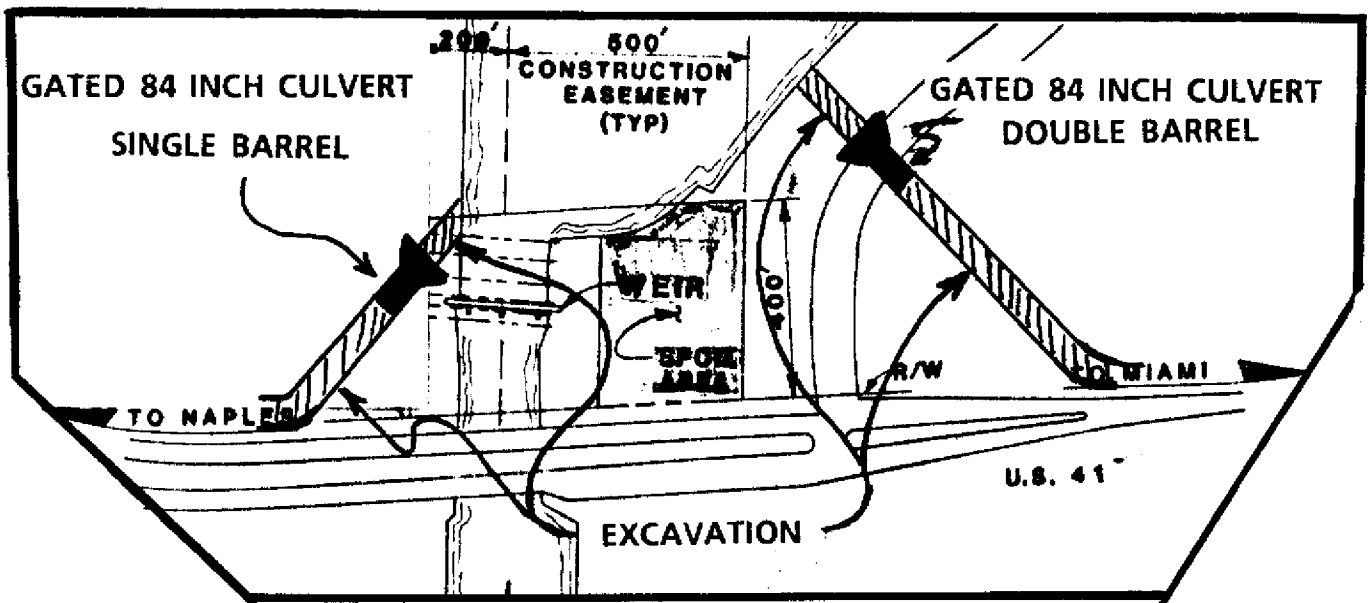


FIGURE 5. - LOCATION SKETCH