

The

Midnight Pass



SOCIETY, INC.

"MIDNIGHT PASS - PASS IT ON!"

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MIDNIGHT PASS POSITION PAPER

RESEARCH COMMITTEE
Dr. John B. Morrill
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February 3, 1990

MIDNIGHT PASS MAINTENANCE

SYNOPSIS

The permit to restore Midnight Pass will likely require a commitment on the part of the applicant to maintain the inlet and related channels. Channel maintenance will return the natural, historic flow of Bay waters west of the Bird Islands. Concerns have been expressed as to how this responsibility will be discharged, where the reclaimed material will be placed and how much it will cost. At the request of Sarasota County, the Midnight Pass Society investigated the maintenance options available and recommended a course of action we feel is efficient, environmentally sensitive and affordable.

RESTORATION PLAN. The proposed plan calls for the replication, to the extent practical, of the 1955 inlet conditions. It also provides for the creation of a deposition basin, a sand bank, inside the inlet proper on the flood tide delta. The sand bank is intended to trap shifting sands to expedite periodic maintenance and to minimize any adverse affects thereof. While the restoration plan originally proposed did not call for maintenance, it was clear "early on" that a commitment would be required from local authorities to maintain the inlet and supporting channels once the Pass was restored.

A review of early charts, hydrographic surveys and aerial photos clearly shows that the prevailing north-south bay current bent WEST of the Bird Islands and interacted with the Gulf of Mexico through the pass existing at that time. The northern and southern channels are naturally well defined. The instability of Midnight Pass commenced with, and was caused in large part by, the creation of the ICW in the early 1960's and the placement of large amounts of un-diked dredge spoil on the Bird Islands. The dredged spoil blocked the sheet flow of water through the Bird Islands. The spoil also shoaled in the northern channel and constricted tidal flow to/from that direction. The shoaling-in was greatly exacerbated by the damming effect of Australian Pines placed in the northern channel around 1970. then, as the inlet migrated northward through historic uplands, additional Australian Pines fell into the channel further blocking current flow.

It is anticipated that most maintenance activity will be confined to the Pass site proper, the sand bank and the close-in section of the northern channel. The balance of the northern channel and the southern

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MIDNIGHT PASS MAINTENANCE
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channel may never need maintenance, especially if a lesser maintained depth is deemed acceptable.

Maintenance options. At the request of Sarasota County, the Midnight Pass Society undertook a comprehensive investigation of available maintenance alternatives. We considered fluidization and sand transfer systems. We considered shoreline alterations, "piping" and all available types of dredging equipment. Attached is our MAINTENANCE DREDGE REPORT and a copy of a summary letter dated June 12, 1989 to Sarasota County.

We recommended the purchase of an eight inch hydraulic dredge with a bucket-wheel cutter head on a suction boom. The rear is anchored using retractable spuds and is moved by steering anchors. Equipment of this size and type are rated to pump up to 200 cubic yards per hour. The total equipment cost would be in the vicinity of \$250,000. Operating costs are conservatively projected to be at or under \$1.00 per cubic yard of material moved.

This assignment was handled, and all recommendations proposed, by four individuals from Sarasota County who are all well regarded in the field of dredging. While costs, efficiency and ease of operation were all considerations, it was stressed that their recommendations be as environmentally sensitive as possible.

It's estimated that no more than 50,000 cubic yards of material might have to be moved annually...but that maintenance may well not be needed every year. The sand reclaimed from the sand bank and other areas would be returned to the beach to offset any erosion. Sand worth at least \$5.00 per cubic yard would be placed back on the beach for about \$1.00 per cubic yard.

Conclusions.

1. The maintenance of Midnight Pass can be handled in an efficient, affordable and environmentally sensitive manner.
2. Maintenance would return the natural, historic flow of bay waters west of the Bird Islands, through established tidal channels.
3. Pass maintenance would be interrelated to a program designed to offset erosion of adjoining beaches.

References.

- A. Historic charts, surveys and aerial photos.
- B. Midnight Pass Society MAINTENANCE DREDGE REPORT (attached).
- C. June 12, 1989 Society letter to Sarasota County (attached).
- D. Discussions with various coastal engineers.
- E. Sand transfer, fluidization and dredging promotional materials.

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June 12, 1989

Mr. Jack Merriam, Director
Sarasota County Natural Resources
Management Department
Post Office Box 8
Sarasota, Florida 34236

Dear Jack,

Approximately three months ago you asked the Society to "dig-in" to the subject of maintenance dredging. The objective was to identify a particular type of dredge that would be capable of handling the "as-needed" maintenance of Midnight Pass once this essential inlet is restored. In addition, you needed an estimate of the capital and operating costs involved.

The Society was delighted to take on this assignment. We trust you'll find our response of interest; it dispels several misconceptions with respect to maintenance dredging. Please don't hesitate to call upon us for future assignments...we've an abiding interest in the environs of Little Sarasota Bay.

This dredge research project was turned over to Society member Jack Petrecca. Jack is a long-time resident of Sarasota County. He's the owner of Petrecca Excavating and certainly knows his way around heavy equipment. Jack also obtained the valuable input of local experts Kenneth Hipp, John Gardner and Carmel Passalacqua.

Enclosed is a copy of Jack Petrecca's report. While a large dredge may be needed to restore Midnight Pass...size, mobility and especially cost dictate that much smaller equipment be employed for maintenance dredging tasks.

Jack classified into three categories the moderate-sized dredges that are available. The horizontal auger type of dredge, while not recommended, was impressive. It moves a lot of material, is easy to operate and is inexpensive. However, it works by pulling itself along lengthy cables...we just couldn't overcome the associated safety/navigation problems. In applications where these cables would cause no concern, this type of dredge should be seriously considered.

The dredge recommended is of the type with a cutter head mounted on a suction boom. While steering anchors are employed, basic movement is accomplished by pivoting on two rear legs, or spuds. Essentially it's a cut-down version of a large dredge. It can move 150 to 250 cubic yards of solids per hour, dredge to a depth of 20 feet and, depending on channel depth, cut a swath 60 to 73 feet wide.

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Mr. Jack Merriam
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The capital cost of a heavy-duty model of this type of dredge would run about \$250,000...complete. It takes a two man crew to operate but only one need be trained to run the equipment. Assuming relatively full utilization, total operating costs would be less than \$1.00/cubic yard.

The performance specifications are especially impressive in light of the modest capital and annual operating costs. And what a deal: for every dollar spent on operations, you reclaim at least a cubic yard of beach sand worth \$5.00! This type dredge is small enough to be easily transported yet pushes a respectable amount of solids/hour. We wanted to set up a field inspection of the dredge in action, but haven't found one operating in this area. We'll arrange a demonstration as soon as we can find a representative dredge within a reasonable distance.

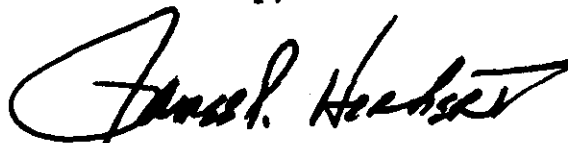
We had originally envisioned the WCIND owning and running this dredge, with that agency becoming operational as well as administrative. In light of the modest costs involved we now believe that Sarasota County should seriously consider the purchase/operation of the dredge. You would be in control of the dredging operation but could still look to the WCIND for a significant portion of the funds. This equipment could be used for a whole host of projects in the County in addition to Midnight Pass. And, if you ever found yourself with excess dredge time, you could always farm the unit out to other WCIND counties on a cost plus basis.

Dredges have historically been considered environmental nightmares. However, in the case of Midnight Pass, dredging would actually significantly INCREASE habitat by relieving the turbid, null zone conditions created by Pass closure.

Unquestionably, the old dragline dredging method damaged a lot of bay bottom. Even state of the art equipment will cause environmental damage when improperly used. But the hydraulic dredges of today are environmentally sensitive...they operate by pumping the agitated area, liquids and solids, to a disposal site. Dredging effects are confined to the immediate area being worked upon, with turbidity kept to a surprising minimum.

In summary, Jack, we're most enthusiastic about this type of dredge. We believe it's the answer to maintenance dredging for Midnight Pass and can be used for many other County projects as well. This type of dredge can move a lot of sand, is affordable, easy to operate and environmentally sensitive. We hope to set up a field inspection soon. Meantime, if you have any questions or would like to discuss this approach in detail, please give me a call. I look forward to hearing from you.

Cordially,



James P. Herbert,
Executive Director

JPH/j
Enc.

Midnight Pass Re-Opening Project

MAINTENANCE DREDGE REPORT

Considerations

- .Type of dredge
- .Efficiency
- .Ease of set-up
- .Cost of operation
- .Ease of maintenance

Maintenance dredging, if needed, will involve much smaller volumes compared to initial re-opening project. Therefore, machines we considered are capable of moving 100-200 cubic yards material per hour a distance up to six thousand feet.

All dredges are floating machines that agitate and put into solution the material to be pumped. The methods of mixing the bottom to a solution that can be pumped are (1) pump water or jet a stream to mix the bottom to a proper solution, or (2) mechanically stir by a cutter on the end of a suction boom suspended from the floating dredge. Efficiency (volume of material moved per unit of water), depends upon the consistency of the bottom. The material to be moved in the Midnight Pass maintenance project is considered by tests to be beach compatible and of the density conducive to ease of movement by dredge.

Most shoaled-in areas are not so large as to require major dredging. (As a point of reference for those not familiar with earth moving, an area 100' x 100' x 3' deep would be roughly 1,000 cubic yards.)

The three types of commercially available dredging equipment we investigated were:

1. The slurry pump, such as the Japanese Toyo pump. This type has to be custom adapted to a barge or float and engineered for each application.
2. The horizontal auger type. This dredge propels itself into the cut by reeling itself back and forth on anchored cables above the water, and sideways by steering cables.
3. The bucket-wheel style cutter head on a suction boom. This type uses steering anchors and pivots on two retractable legs, or spuds.

Recommendation

We do not recommend No. 1 above because: this type is designed primarily for mining operations and the problems with special engineering for our project we consider to be prohibitive.

We do not recommend No. 2 above because this system would inhibit boat traffic for a large area near operations due to cables strung in several directions above or at the water line. We consider the hazards involved would not outweigh the advantages due to the length of time cables would have to be in place.

Midnight Pass Re-Opeing Project

MAINTENANCE DREDGE REPORT

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Our recommendation for maintenance dredging is the bucket-wheel type, such as that manufactured by Ellicott Machine Corporation. This equipment is U.S. made, has a good reputation for parts, service and production and has been manufactured for many years.

Cost of operating this type machine is approximately \$1.00 per cubic yard of material moved, including labor, insurance and fuel. Operator efficiency and ease of spoil area preparation would vary costs. Machines of this size (up to 200 cubic yards per hour) can be operated with a one to three man crew, two of whom need only be unskilled labor.

The environmental impact or amount of turbidity can be controlled on these machines by reducing cutter speeds and pumping all disturbed bottom to the disposal site.

These machines are available and ready to work for \$115,000 and up depending on type, amount of discharge distance, and volume per hour required.