

MEMORANDUM

TO: Calvin Peck, Village Manager, VBHI
FROM: Erik J. Olsen, P.E. EJO
DATE: 25 September 2008
RE: West Beach Shorefront – Point to Bald Head Creek



Coastal Engineering

Earlier this week, I forwarded to Dr. Paul Hearty a Discussion Paper formulated in May of this year related to certain marina entrance improvements. Albeit simplistic, the paper was originally intended to allow for a better understanding of modifications necessary to reduce channel dredging and associated recurring impacts to West Beach without sacrificing the downdrift shorefront which extends from the marina entrance to Bald Head Creek.

In my view and experience, it is clear that since the original construction of the marina, the integrity of the downdrift shorefront to the north has been highly dependent upon the timber groinfield and sand bypassing in order to keep it "whole". Over recent years, the frequency and volume of bypass dredging (due to increased channel maintenance requirements) has been great enough to result in substantial shorefront accretion well north of the marina basin as well as produce additional pressure on the rate of shoaling (and the configuration of the depositional spit) at the entrance to Bald Head Creek.

It is my continuing opinion that this entire process could be strategically "throttled back" somewhat by improving the sand retention capabilities of the structures at the marina entrance (both jetties and timber groinfield). Reconstruction of the timber groins and the extension/rehab of the jetty structures via rock placement, with ideally a small rock spur on the West Beach side, would be the apparent preferred engineering solution. Ideally maintenance dredging could be reduced, (but not eliminated) so as to continue to have some northward volume of bypass material in the future. On the updrift side of the marina entrance, a completely reconstructed groinfield (with perimeter rock at the head of each structure) would result in better beach sand retention and foster upland growth of vegetation and potentially some level of dune. Management of the dredging and sand placement operation should likewise be a priority. The method by which beach disposal of sand is currently performed is somewhat counter-productive.

I recommend that the Village seek a long-term dredging permit at the entrance to Bald Head Creek and the concurrent back-passing of sand to West Beach for purposes of beach enhancement and to the west end of South Beach for storm impact mitigation (if necessary). I would point out that *if* the intent is to keep the creek entrance sufficiently open for navigational purposes, a structure would in all probability ultimately

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be required. As we know from past experience, however the introduction of a structure as part of the plan-of-action would make permitting significantly more difficult. The only other alternative would be high-frequency or larger volume dredging. If the goal were to principally facilitate a sand source for back-passing, the need for a structure would be somewhat irrelevant. In this regard however, a soft (sand tube) terminal structure could initially serve as a viable prototype – prior to the determination of the propriety of a permanent terminal structure. This however assumes “permeability”. At a minimum, I would recommend that a new Permit be sought which seeks to initially dredge up to 100,000 cubic yards. A survey will need to be accomplished to validate this volume and assure no long term impacts to the creek marsh fringe.

I have discussed most of these matters with Dr. Paul Hearty and we are in general agreement on the nature of large scale erosional and depositional processes throughout the area of interest. We both agree on the need to dredge the entrance to Bald Head Creek. As I would expect, Paul is not necessarily an advocate of structural measures. In this regard however, I continue to opine that structures are necessary to maintain certain beach configurations and reduce rates of sediment transport in several severe erosional hot spots. Row Boat Row to the north of the marina entrance is a good example. If the existing timber groins were removed, this beach would be lost within a relatively short period of time. The loss of a protective beach would jeopardize the abutting residences. Hence, the continued use of structures (and the proposed rehabilitation of same) at this location remains necessary.

Thank you for your consideration in these matters.