

Roberta Thuman

From: Cliff Ogburn
Sent: Thursday, January 21, 2010 9:42 AM
To: Roberta Thuman
Subject: FW: Answers to Questions

1) If we only nourishment the south end, we reduce the longevity of the fill significantly. Project longevity (as measured by sand remaining in the nourishment area after a certain period of time) is related to the square of the project length (National Acad of Sciences 1995). In other words, a 10 mile-long project would be expected to last ~4 times longer than a 5 mile project. If we assume the "middle scenario" project as formulated would last 16 years (250,000 cy lost/yr), then halving the project length would reduce its design life to <5 years. Of course, this simple example would be further modified if the fill is placed along the north half of Nags Head where erosion losses are much lower. Placing sand at the north end of the beach ends up feeding the areas to the south over time. The downside to this is the south end never gets a sudden large input of sand to give it a chance to recover. Sand trickling down simply reduces the erosion rate (but doesn't reverse it, or restore the south beach to a viable condition for any length of time). Doing half a project also creates perceptions of failure. Imagine what would happen if only the southern 2 miles of Nags Head were nourished. It would erode even faster (unless retained by a large terminal groin at the town limit).

2) The permits generally allow you to do a project in phases as long as the total scope of work does not exceed the permitted volumes, and the placement areas remain consistent with the plan illustrated on the permit. The town may elect to do any fractional portion of a project, as long as the change is a reduction in length or unit volumes. Normally, permits run for 5 years and may be renewed if the full scope of work cannot be accomplished within the initial 5 years. The issues associated with #1 above would apply to any phasing of reaches or volumes over several years. Obviously, it would be advantageous to perform a 2-phase project in back-to-back years so as to minimize the effects of building shorter segments. Remember, if we split the project, the mobilization costs essentially double. Unit costs may also be higher because we lose some economies of scale.

3) We've been assuming \$7.50 per cy since presenting the July 2008 estimate (attached) to your board in August 2008. Fuel costs were a big factor in 2008, but have since gone down. Fuel represents ~15% of dredger's costs so the reduction since fuel prices peaked in 2008 keeps our estimate in a realistic range.

4) The final design for the fill template will work around any structures sitting on the active beach. We make sure that the dredger does not place any equipment under houses for reasons of liability. The fill template may be modified on the seaward side of exposed houses to provide extra height in the berm or provide a stockpile for owners to tap (if allowed by CZM rules). In some situations, the municipality has requested/required owners to import beach quality fill by trucks at their own expense and fill the depression under houses (because of drainage issues) soon after the nourishment is placed. In other situations, state regulators allowed property owners (at their own expense) to shift some excess sand, placed by dredge just seaward of buildings, under the houses or on the landward side of houses so as to avoid leaving depressions. This will have to be addressed on a case by case basis. The town's lawyer will have to weigh in on this, but in my experience, you should avoid getting into any situation where the town is condemning property just before a project. Let the state be the bad guy, otherwise you'll end up spending much of your budget on legal challenges.

As part of our design analysis the next two months, we're evaluating questions regarding longevity like those you've posed. One of the key things we're trying to do is update the longterm, background erosion rates by reach (on which project longevity depends). The Veterans Day storm gives us a great benchmark for evaluating the viability of the plan and determining whether some lessor plan would also be viable (say, lower fill

volumes, but similar project length). If long-term loss rates are significantly less than 250,000 cy/yr, an alternate formulation may be acceptable. We've accumulated much more data on loss rates since 2005 which, if nothing else, suggest our "lower scenario" project formulation remains viable for a 10-yr project. Costs of the lower scenario are closer to \$30 million.

Timothy W. Kana, PhD

President

Coastal Science & Engineering

PO Box 8056
Columbia SC 29202-8056
803-799-8949 - Office
803-799-9481 - Fax
803-361-3583 - Mobile
www.coastalscience.com

Cliff Ogburn wrote:

Can you adjust this?

Ball park is fine. I just need to begin the discussion tomorrow night on how we are going to come with the money and I would like a close estimate on what the figure is.

Thanks-

-----Original Message-----

From: Cliff [<mailto:ogburn@townofnagshead.net>]
Sent: Tuesday, January 19, 2010 11:58 AM
To: Cliff Ogburn
Subject:

This E-mail was sent from "RNPDCD9AC" (Aficio MP C4500).

Scan Date: 01.19.2010 11:57:55 (-0500)