The following is a powerpoint presentation on inlet widening options for Bourne that was made on December 6th to the WQMC.

Committee discussed the options and voted that Scenario 2 – double span was the preferred option.

Quick background is that in the SMAST analysis of the south coastal estuaries they evaluated if “inlet widening” was beneficial to the estuaries. For both Bourne and Little Pond widening the inlet was seen as beneficial. For the remaining estuaries – Green, Great and Waquoit enlarging the estuary had no or limited value.

Bourne Pond inlet widening has the largest apparent benefit and the WQMC is proceeding to develop an inlet widening plan for that location.
Bournes Pond Inlet Opening
Draft Findings and Recommendations

Nathan C. Weeks, P.E., BCEE | Senior Project Manager
Outline

• Project Team and Scope
• Hydrodynamic modeling to optimize the inlet opening size
• Identification and screening of 4 alternative scenarios
• Cost development of the 2 best scenarios
• Permitting considerations
• Recommendations
Project Team

- Falmouth WQMC
  - Eric Turkington
  - Virginia Valiela
- Falmouth DPW
  - Jerry Potamis
  - Ray Jack
  - Peter McConarty
- GHD
  - Jeff Gregg
  - Nate Weeks
- Applied Coastal Research and Engineering
  - John Ramsey
  - Trey Ruthven
- BETA Engineers
  - Mark Gershman
Project Scope

- Hydrodynamic modeling to optimize the inlet opening
- Evaluate alternative inlet openings and bridge types
- Develop preliminary design information and costs
- Develop permitting strategy
- Summarize findings
Hydrodynamic Modeling to Optimize the Inlet Opening Size

- Update to the existing RMA-2 hydrodynamic model used as part of the Estuaries Project
- Additional data collection at the inlet
- Multiple model runs to optimize the inlet and develop preliminary design information
Alternative Inlet Openings

- Scenario 1: Single-span bridge
- Scenario 2: Double-span bridge
- Scenario 3: Additional culvert bridge to the east of the existing bridge
- Scenario 4: Culvert bridge comprised of 5 culverts
Existing Opening

[Image of Existing Opening diagram]
Scenario 1: Single-Span Bridge
Scenario 2: Double-Span Bridge
**Scenario 3: Existing Bridge with Culverts Added**
Scenario 4: Replace Bridge with 5 Culverts
Screening of Alternatives

Two Alternatives Selected for Cost development

• Scenario 2: Double-span bridge

• Scenario 4: Multiple culvert bridge
## Cost Estimate

<table>
<thead>
<tr>
<th>Capital Costs</th>
<th>Scenario 2: Double-Span Bridge</th>
<th>Scenario 4: Multiple Culvert Bridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge and Road Work</td>
<td>2,500,000</td>
<td>2,600,000</td>
</tr>
<tr>
<td>Jetty Modifications and armoring</td>
<td>800,000</td>
<td>720,000</td>
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<tr>
<td>Dredging and Beach Nourishment</td>
<td>75,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Permitting Allowance</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Design</td>
<td>400,000</td>
<td>400,000</td>
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<tr>
<td>Engineering during Construction</td>
<td>520,000</td>
<td>520,000</td>
</tr>
<tr>
<td>Contingency (25%)</td>
<td>920,000</td>
<td>930,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,520,000</strong></td>
<td><strong>5,550,000</strong></td>
</tr>
</tbody>
</table>

### Notes:
1. All capital costs referenced to a date of January 1, 2013.
2. All costs are rounded to 2 significant digits except the total which is rounded to 3 significant digits.
3. Engineering during construction includes fiscal and legal allowance.
Permitting Strategy

• Develop support from the Executive Office of Energy and Environmental Affairs (EOEEA) Nutrient Management Workgroup
• Convene a pre-submittal meeting
• Prepare and Submit Expanded Environmental Notification Form (ENF) as part of the Massachusetts Environmental Protection Act (MEPA) review
• Expect some Special Conditions in the MEPA approval certificate
Permitting Strategy (continued)

- Develop and coordinate permit application and approval process
  - Notice of Intent and Order of Conditions (Falmouth Conservation and MassDEP)
  - 401 Water quality Certification (MassDEP)
  - Chapter 91 License (MassDEP)
  - 404 Permit (U.S. Army Corps of Engineers)
  - Coastal Zone Consistency (Massachusetts CZM)
  - Natural Heritage and Endangered Species Program (NHESP) approval
Next Steps

- WQMC discussion and decision on bridge type
- Prepare summary
- Town decisions on funding
- Town Meeting appropriation
- Initiate permitting