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Subject: REVISED Meeting Notes for the August 21, 2012 Interagency Meeting on Potential Impacts to the New Bedford Hurricane Barrier from Blasting Associated with the South Terminal Project (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

All:

Enclosed are my REVISED Meeting Notes for the August 21, 2012 interagency meeting where we discussed potential impacts to the New Bedford Hurricane Protection System ("HPS") associated with potential blasting work from the South Terminal Project. I incorporated recommendations from Mike Marsh and Scott Michalak when putting together the REVISED Meeting Notes. Please let me know if you have any outstanding concerns and/or recommendations with this summary. I wanted to run my REVISED Meeting Notes by you to ensure that I adequately covered the major discussion points before sending them out for wider distribution. I hope to forward this document to the EPA South Terminal Team sometime tomorrow, August 28, 2012, if possible. Thanks for your review.

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DRAFT MEETING NOTES:

On Tuesday August 21, 2012 representatives from the Commonwealth of Massachusetts, Apex Companies, the U.S. Army Corps of Engineers, and the Environmental Protection Agency ("EPA") met to discuss the scope of potential impacts that blasting associated with the South Terminal Project may have on the adjacent New Bedford Hurricane Protection System ("HPS"). Attendees to this meeting included Gary Davis (Massachusetts EEA), Jay Borkland (Apex), Chet Myers (Apex), Michael Marsh (EPA), Mike Keegan (Corps), Scott Michalak (Corps), Michael Bachand (Corps), Rose Schmidt (Corps), and Paul Sneeringer (Corps). This document summarizes the major discussion points from this meeting.

1.) The Commonwealth of Massachusetts made it clear that their preference is not to blast. They understand the spectrum of regulatory, engineering, and political concerns associated with blasting.

2.) The limited boring surveys that have been completed for the South Terminal Project have identified the presence of shallow bedrock formations in and adjacent to the proposed marine terminal bulkhead and the proposed navigational channels. The boring logs from previous surveys document a bedrock layer starting at depths between -25 and -35 feet mean lower low water ("MLLW"). Therefore, the presence of this bedrock would not likely be a concern for the proposed dredging of -14 foot MLLW tug channel. However, it will likely be a concern for the dredging of the proposed main shipping channel (-32 foot MLLW) and the construction of the South Terminal Bulkhead, where up to 5-8 feet of bedrock may need to be removed.

3.) Apex indicates that the bedrock appears to be fractured. This material may be able to be removed without blasting, but there is a good detail of uncertainty about this issue due to the current level of survey. Although the Commonwealth could specify that blasting is not allowed to remove the bedrock, they are concerned that the timing of this work could greatly delay the construction schedule for South Terminal and it is uncertain how the "no blasting" requirement would affect potential bidders for this project. Based upon these reasons, the Commonwealth is interested in continuing to pursue the blasting option.

4.) Scott Michalak of the Corps indicated that he has significant concerns about the potential impacts that blasting could have on the adjacent New Bedford HPS. The New Bedford HPS foundation was not built into the underlying bedrock, but instead into the overburden of sands and silts. Seismic waves from the proposed blasting could directly lead to settlement issues for the hurricane barrier.

5.) Due to the potential impacts to the New Bedford HPS, the Corps will need to accept a FINAL blasting plan (33 CFR 408) prior to the Commonwealth starting blasting operations. Scott Michalak indicated that Corps Headquarter would need to review and accept the FINAL Blasting plan. Nationwide problems with the undermining of Corps Dams and Levees has been a major issue for Corps Headquarters recently. So there is no guarantee that the Corps Headquarter will approve a blasting plan for this South Terminal Project. Therefore, the Commonwealth should seriously consider alternative non-blasting techniques to break up the bedrock (e.g., expansion grout).

6.) The Corps indicated that they will need to review the information on the attached additional information list before a blasting review package can be circulated to Headquarters. The Commonwealth will need to model seismic impacts associated with the proposed blasting plan, conduct a liquefaction analysis, and provide more detailed information on the slope stability of existing overburden. Last week the Corps provided the Commonwealth and Apex with the original site geology and embankment and foundation design memorandums for the New Bedford HPS. This information will be helpful to put together the blasting analysis. The Commonwealth may choose to reduce the size of explosive charges in order to limit potential collateral blasting impacts. It will be

important to identify conservatively sized charges when doing the seismic modeling, in order to allow for potential over loading of charges by the blaster and to maintain a level of safety. The Corps also indicated that they will review and make recommendations on the DRAFT Construction Specifications for Blasting, which were included with the June 18, 2012 submittal. Once the New England District team has adequate documentation for a FINAL Blasting Plan, this information will need to be submitted for review by the Corps Headquarters. The Commonwealth should expect that the Corps Headquarters review will likely take at least 4-6 months before a Section 408 acceptance letter can be finalized.

Additional Successional Marsh Discussion:

In general, the Corps Levee Safety Team is supportive of proposed changes to the design for Successional Marsh Mitigation work within the New Bedford HPS drainage way. By limiting the work to expanding the channel, impacts to the hydraulic capacity of the drainage way have been avoided. The Corps Levee Safety Team has a few additional design recommendations for the Successional Marsh Mitigation work. The Commonwealth may want to conduct a bank stability analysis to see if the banks adjacent to the salt marsh creation/restoration areas need to be armored. If armoring is need, the Commonwealth should consider reusing the existing riprap. Finally, abandoned pipelines (through the hurricane barrier) should be appropriately grouted and sealed to minimize potential erosive pathways through of the hurricane barrier.

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