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Corporate Environmental Services
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January 17, 2017

Mr. Lucas Berresford
Project Manager
South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201

**RE: Viability of Large Sandbags
SCE&G - Congaree River Sediments
Columbia, South Carolina**

Dear Mr. Berresford:

Per our recent discussions, below summarizes the results of the large one-ton sandbag testing activities completed during the Field Demonstration Project (FDP) conducted by South Carolina Electric & Gas Company Inc. (SCE&G) as part of the Congaree River sediment remediation project in late 2015. It is for the reasons described below that the large sandbags (Big Bags) were determined to not be a viable option for isolating and dewatering areas for subsequent sediment excavation.

One of the objectives of the FDP was to evaluate the effectiveness of utilizing Big Bags to construct a barrier to restrict river water infiltration into a work area and allow for simulation of a dewatering and excavation scenario. During the FDP, a long-reach excavator was utilized to place the bags a significant distance from the shoreline. The following was learned from the deployment of the Big Bags during the FDP:

- Filling the Big Bags, transporting them to the limited-access, river work area and placing them in position was a relatively slow process. Removing the Big Bags at the end of the project was a relatively time consuming task as well. This was primarily due to the need to handle each Big Bag separately. Bag placement and removal during a full-scale project would be so time consuming that it would take many construction seasons to complete the project, even in the reduced Modified Removal Action (MRA) area.
- Even with a long-reach excavator, placement of the Big Bags any significant distance from the shoreline was not possible without major access improvements, which would further increase the impact to the area and the time to complete the project.
- Placing the bags close enough together to create an adequate seal in deeper water is very difficult and allows for seams between bags that negate their water tightness. Big Bags are often effectively deployed on dryland before a flood and are more watertight and as a result, more effective, but placement within the water column at any depth is difficult to ensure a close, tight fit.
- The two to three Big Bag wide base and two Big Bag tall configuration utilized during this FDP was not adequate to control water intrusion/infiltration, leaking and overtopping. For actual work in the river, a wider base of staggered Big Bags (minimum five wide) and higher and wider top layers would be required to be at least minimally effective at controlling water. This drastically increases the amount of bags requiring placement in the deeper water and the resultant amount of bags that

need to be removed, as well. Effectively deploying this amount of bags up to 200 feet into the river would be extremely difficult.

- Excavation of the sediment at the base of the Big Bags would result in a pathway for increased infiltration. Placement of additional Big Bags in this zone would likely be required and increase the width of the sand bag base. A heavy-duty liner placed on the outboard side of the Big Bags would also provide added benefit, but would significantly increase the complexity of the project. In reality, use of the Big Bags would result in a structure of similar dimensions at the base in the deeper water areas as would the implementation of a stone cofferdam, with less effective water tightness.
- In order to keep the footprint of the bag placement area within realistic limits, the height of the bags would need to be limited and the overall height of the structure would also be limited, which would make the project more susceptible to overtopping. Overtopping increases the project timeframe, reduces the amount of actual work days available for removal operations and increases the potential for downstream migration of disturbed sediment. The risk of overtopping while the sediment is exposed (during excavation) represents a very real risk of mobilization of organics down river should such an event occur. The sand bag concept cannot adequately address this risk.
- Water infiltration through the sediment located between the base of the Big Bags and the bedrock interface was significant enough in even the small areas tested during the FDP to require continuous dewatering efforts. This infiltration, in deeper areas, would likely be much more severe and would be extremely difficult to manage.

As a result of these limitations, utilizing Big Bags for the isolation berm for the MRA would not be a viable alternative. If you have any questions or require any additional information, please call Rusty Contrael at 412-829-9650 or me at 919-819-2748.

Sincerely,



Robert M. Apple
Remediation Project Manager

cc: R. Contrael, B. Zeli, T. Wolf – Apex