

**FIND Dredged Material Management Areas: Evaluated Salinity Control Options for Offsite Groundwater Protection**

Since 2014, Taylor Engineering has been working with FIND to evaluate a range of salinity control options for offsite groundwater protection. Detailed groundwater modeling and feasibility studies have been conducted for three of FIND’s inland dredged material management sites; most recently, these studies included BV-24A. The table below summarizes the range of options considered along with the on-site feasibility comments and approximate construction costs specifically associated with site BV-24A.

Salinity Control Option	Advantages	Disadvantages	On-Site Feasibility	Approximate Cost*
Sheet Pile Cut-off Wall	<ol style="list-style-type: none"> <li>1. Ability to contain soil and water</li> <li>2. Chemically resistant</li> <li>3. Excavation not required</li> <li>4. Barrier could be irregularly shaped</li> </ol>	<ol style="list-style-type: none"> <li>1. Sheet pile joints can leak</li> <li>2. Poly-Vinyl sheet pile limited to approximately 20 feet</li> <li>3. Driving sheet piles causes lot of noise</li> </ol>	Presence of partially cemented layers in the subsurface makes this option difficult to install on-site	Not evaluated
Slurry Cut-off Wall	<ol style="list-style-type: none"> <li>1. Ability to contain soil and water</li> <li>2. Chemically resistant</li> <li>3. Quick installation up to 100 feet deep</li> <li>4. Construction techniques well understood</li> </ol>	<ol style="list-style-type: none"> <li>1. Need for excavation producing large spoils</li> <li>2. Slurry wall may degrade over time</li> <li>3. Proper installation is difficult to ensure</li> </ol>	The ambient subsurface conditions would require deep (~100 feet) slurry to be installed which can be very expensive and difficult to quality control	\$4.4 Million (at \$6 per square foot)
Lined Bottom	<ol style="list-style-type: none"> <li>1. Ability to contain soil and water on surface</li> <li>2. Chemically resistant</li> <li>3. Quick surface installation</li> <li>4. Effectively blocks all infiltration</li> </ol>	<ol style="list-style-type: none"> <li>1. Involves long-term management of saline storm water due to presence of salt</li> <li>2. Lack of proper construction may cause leaks</li> <li>3. Impacts dredged material consolidation process</li> <li>4. Prone to damage during periodic site-offloading</li> <li>5. Damage to the liner would invalidate protection</li> </ol>	With a significantly long design life, careful installation, and protection during offloading, a liner can be a feasible option. However, this approach would require impractical semi-permanent impoundment of saltwater onsite or, more likely, conveyance of saltwater offsite. Therefore, this option would also require construction of a perimeter intercept ditch with permanent discharge pipeline (see below).	\$3.0 Million (at \$1.50 per square foot)

<p>Intercept Ditch with Permanent Discharge Pipeline</p>	<ol style="list-style-type: none"> <li>1. High degree of quality control during construction</li> <li>2. Long design life with proper maintenance</li> <li>3. The pipeline ensures ability to control water levels in the basin and continually convey saline water (and stormwater) away from the site.</li> </ol>	<ol style="list-style-type: none"> <li>1. Intercept ditch is easy to construct, maintain, and monitor. However, to be effective, requires construction of a relatively costly permanent pipeline.</li> </ol>	<p>Onsite construction is a feasible and, based on groundwater modeling, effective means to protect offsite groundwater. Pipeline construction offers some traditional construction challenges.</p>	<p>\$2.3 Million</p>
<p>Lined Bottom with Permanent Discharge Pipeline</p>	<ol style="list-style-type: none"> <li>1. Includes previously stated advantages for both a lined bottom and interception trench with permanent discharge pipeline</li> </ol>	<ol style="list-style-type: none"> <li>1. Costly to construct</li> </ol>	<p>While feasible, the combination of the two saline control alternatives is an extremely expensive option</p>	<p>\$5.3 Million</p>

\* All cost estimates are approximate and are intended to provide relative cost comparison.

Note: Option highlighted in yellow was selected