Glynn County Superfund Sites
LCP Chemicals Superfund Site:
Estuary Proposed Plan Overview
November 2014

Site Background

The LCP Chemicals Superfund Site consists of approximately 550 acres, the majority of which is a tidal marsh. For about 70 years, various manufacturing industries operated at the site. These industries contaminated the site with mercury, lead, polychlorinated biphenyls (PCBs), and other toxic chemicals. These contaminants impact the site's soil, ground water, tidal marsh sediment and marsh biota. The LCP Chemicals site is currently occupied with process buildings, an administration office and a caustic brine treatment plant. The site cleanup is being managed in three parts, which are the estuary, the groundwater, and the upland soils and sediments.

Aerial view of LCP Chemicals Site—Photo: James Holland

The Superfund Process

A draft of the Feasibility Study for the Estuary was released in June of 2014. Based on the results of the **Feasibility Study**, the Environmental Protection Agency (EPA) developed a **Proposed Plan** for cleaning up the site. The **Proposed Plan** describes in detail the proposed cleanup alternative for cleaning up the site-related chemicals in the Estuary. Members of the community can submit comments on the Plan to the EPA. At the end of the comment period, the EPA develops a Responsiveness Summary to respond to the received comments. If significant changes are made in the **Proposed Plan** due to the public's comments, the EPA will release an explanation of the changes made, and hold another public comment period. After the final changes in the **Proposed Plan** are made, the **Record of Decision (ROD)** will be released. The **ROD** explains which cleanup alternative that will be used at the site. It also contains extensive background information on the site and provides recommendations for future use of the site.

The Estuary at the LCP Chemicals Site is currently at the Proposed Plan stage

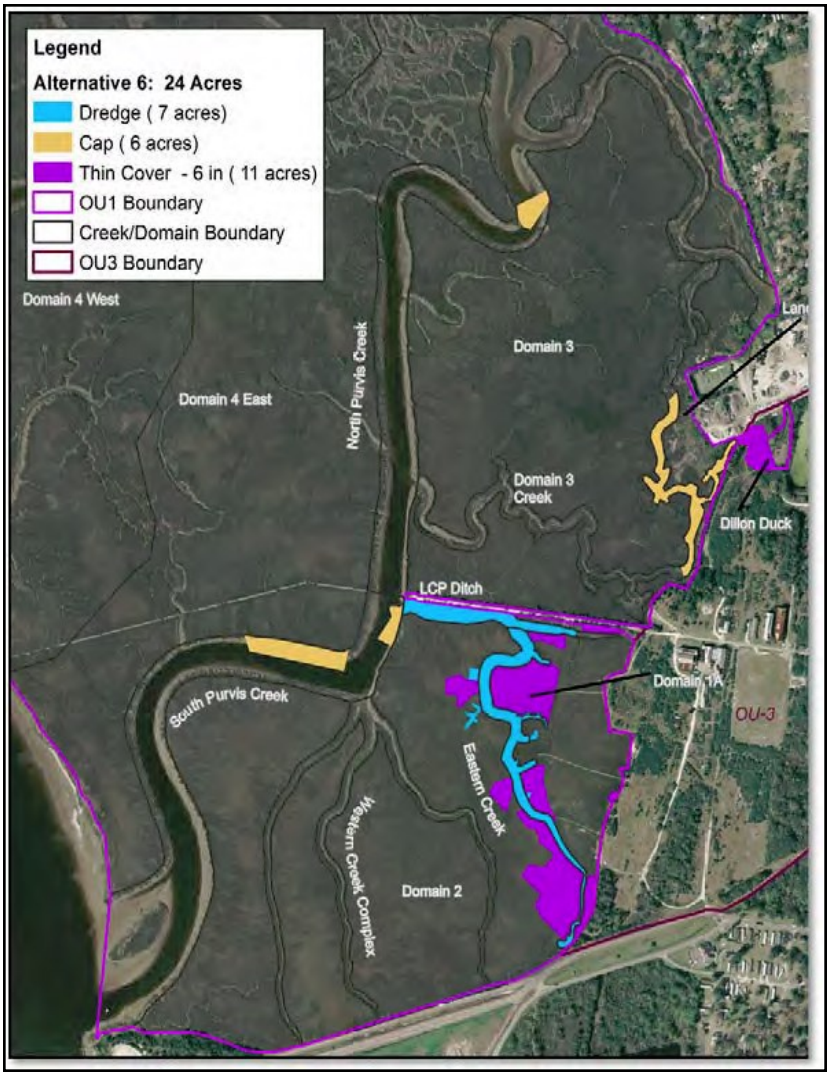
Historical Highlights for the LCP Site

- **August 1980:** Site discovery
- **January 1984:** Preliminary Assessment
- **June 1996:** The LCP site placed on National Priorities List (NPL)
- **April 2011:** Ecological Risk Assessment for the Estuary
- **November 2011:** Human Health Risk Assessments for the Estuary
- **June 2014:** Estuary Feasibility Study
- **November 2014:** Estuary Proposed

Estuary Proposed Remedy

The EPA has proposed Alternative 6 as the preferred cleanup method for the Estuary at the LCP Chemicals site. Alternative 6 involves **sediment removal**, **capping**, and **thin-cover placement**. These remedial actions will take place on about 24 acres of site and will take about two years to complete. The estimated cost of the cleanup is $28.6 million.

Sediment removal and backfilling will occur in Eastern Creek and LCP Ditch (map to the right). Capping will occur in Purvis Creek and Domain 3 Creek. Thin-cover placement will occur in Dillon Duck and the vegetated marshes of Domain 1a and Domain 2. Alternative 6 also includes a plan for **short and long-term monitoring**. The Plan states that Alternative 6 was chosen because it is the most effective remedial alternative for the Estuary.



Sediment Remedy Alternative 6: Sediment removal, capping, and thin cover Source: LCP Chemical Superfund Site Proposed Plan

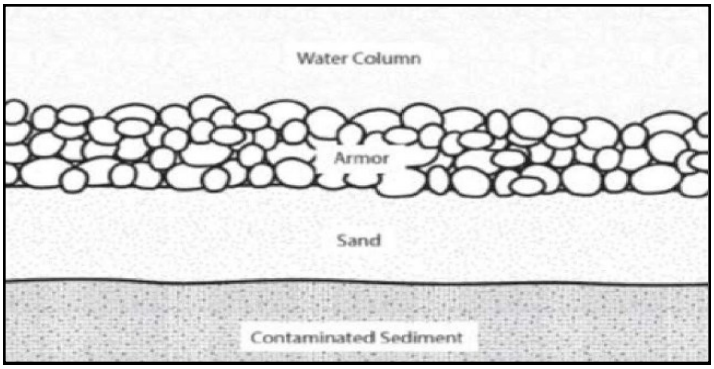
Mechanical dredging (left) and hydraulic dredging (right). Mechanical dredging involves a crane set on a barge that removes sediment with a clamshell bucket. Hydraulic dredging involves removal by pumping sediment and water together. Both must have a place to put the sediment after it is removed. Source: LCP Chemical Superfund Site Feasibil-

Sediment Removal and Backfilling
The EPA has proposed to remove sediment from seven acres of the Estuary. Sediment will be removed through dredging by mechanical or hydraulic dredging (see photos on previous page). In these areas, 18 inches of contaminated sediment will be removed, the water will be removed from the soil on-site, and then the dry sediment will be disposed of at off-site facilities. After removing the sediment, the impacted areas will be "backfilled," which means refilled, with 12 inches of clean material such as sand.

Sediment Capping
Sediment capping involves covering contaminated sediment with layers of clean material such as sand or gravel. The caps are meant to isolate the contaminated sediment underneath so that chemicals cannot escape. In the example figure to the right, the two layers of sand make up the cap. EPA wants to cap six acres of the stream beds of Purvis Creek and Domain 3 Creek.

Hydraulic dredge spraying a **thin layer** of material to restore wetland at the Blackwater Wildlife Refuge, MD. Source: LCP Chemical Superfund Site Feasibility Study

Thin-Cover Placement
Thin-cover placement involves using sand, soil, or another material to enhance the process of natural recovery (see photo above). The material is placed on the sediment bed surface to provide a clean surface for habitat recovery and to reduce risks to human health. Thin-cover placement involves a much thinner layer than capping. The proposed thin-cover placement will cover about 11 acres of the Dillon Duck, Domain 1A and Domain 2.



Cross-section diagram of what the estuary bed will look like after capping
Image: LCP Chemical Superfund Site Proposed Plan

Short- and Long-term Monitoring
Short-term and long-term maintenance and monitoring programs will be implemented to make sure the remedy continues to protect the environment. Short-term monitoring will take place during the construction phase, and involves making sure that all work projects are being completed exactly as designed.

Long-term monitoring will take place during the months and years that follow the end of remediation at the site. Long-term monitoring measures the effectiveness of the remedy in improving ecosystem health and may include the following activities:

- Physical measurements to monitor how well the cap is holding up
- Visual observations and surveys of marsh recovery, including plant growth and plant density
- Chemical measurements in fish and shellfish
- Chemical measurements in sediment
- Surface water quality measurements

Great Blue Heron eating a blue crab
Photo: Todd Dixon, flickr.com

Issues with the Proposed Plan

The following items in the Proposed Plan for the cleanup of the Estuary LCP site raise concerns:

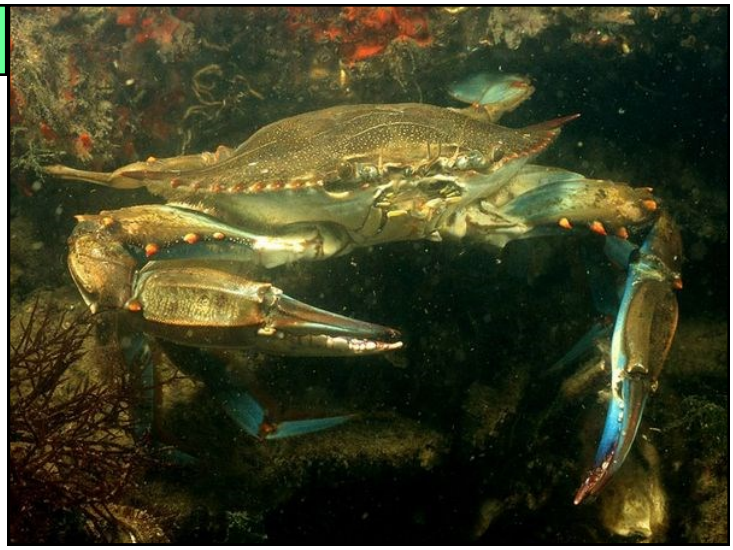
- There needs to be more sediment removal, compared to capping and thin-cover placement, because sediment removal is a more effective and permanent cleanup option.
- A re-planting program of *Spartina* (a salt marsh grass) post-remediation should be one of the first monitoring efforts to help speed up ecosystem recovery.
- The evaluation of the way the LCP site is used by community members is inaccurate.
- Atlantic bottlenose dolphins are an essential part of the local ecosystem and are not included in the ecological risk assessment for the site.
- Thin-cover placement, or enhanced natural recovery, is not a sustainable recovery method.
- The Human Health Risk Assessment is inadequate to protect humans.

Sediment Removal vs. Capping

Capping and thin-cover placement have been proposed as cleanup methods for large sections of the site. However, both of these methods cover up rather than clean up the contaminants of concern. Sediment removal is a viable option for the LCP site and should be implemented on a larger scale.

While the Proposed Plan claims that thin-cover placement, or caps, is a well studied method for site cleanup, fewer than ten thin layer caps have been placed at contaminated sites in the United States. Many of the examples of thin-layer capping found in the Feasibility Study are actually lakes or bays. The thin-layer capping examples include estuarine, river, and tidal flats, all environments with greater water depths and faster currents than a typical salt water marsh. The thin-layer capping examples in the Proposed Plan are not very relevant to the LCP site.

As larger storms and hurricanes occur more often, there will be an increased chance that the contaminated sediments at this site will be disturbed and capping will not be protective enough.



Blue crab
Photo:animals.nationalgeographic.com

Salt Marsh Grasses

The cleanup process for the marshes of the LCP sit will involve the removal of native marsh vegetation, which is essential for the health of the ecosystem. The Proposed Plan relies heavily on the assumption that marsh plants will re-grow on their own within two years. However, the Plan must include a re-planting program in order to speed up recovery of the ecosystem post-remediation. *Spartina* is a grass native to the coastal salt marshes of Georgia. *Spartina* will attract native wildlife, which will in turn help the ecosystem return to a normal state of being.

Salt Marsh Grass *Spartina*
Photo: Wikipedia

Estuary Use by People

The Proposed Plan states that the Estuary is rarely used for recreation because it is too difficult to navigate with a small boat, and therefore the impacts of cleanup on that area do not need to be considered. Yet there is no data outside the Purvis Creek area to show that the waterways of the Estuary are used infrequently. Community surveys must be completed before the Plan can conclude that community members are not using this area for fishing or recreation.

Dolphins

Atlantic bottlenose dolphins, which inhabit the Turtle/Brunswick estuary and coastal waters, are apex predators in the southeast. This means that they are at the top of the food chain and have no predators of their own. They play a key role in the ecosystem by controlling fish populations.

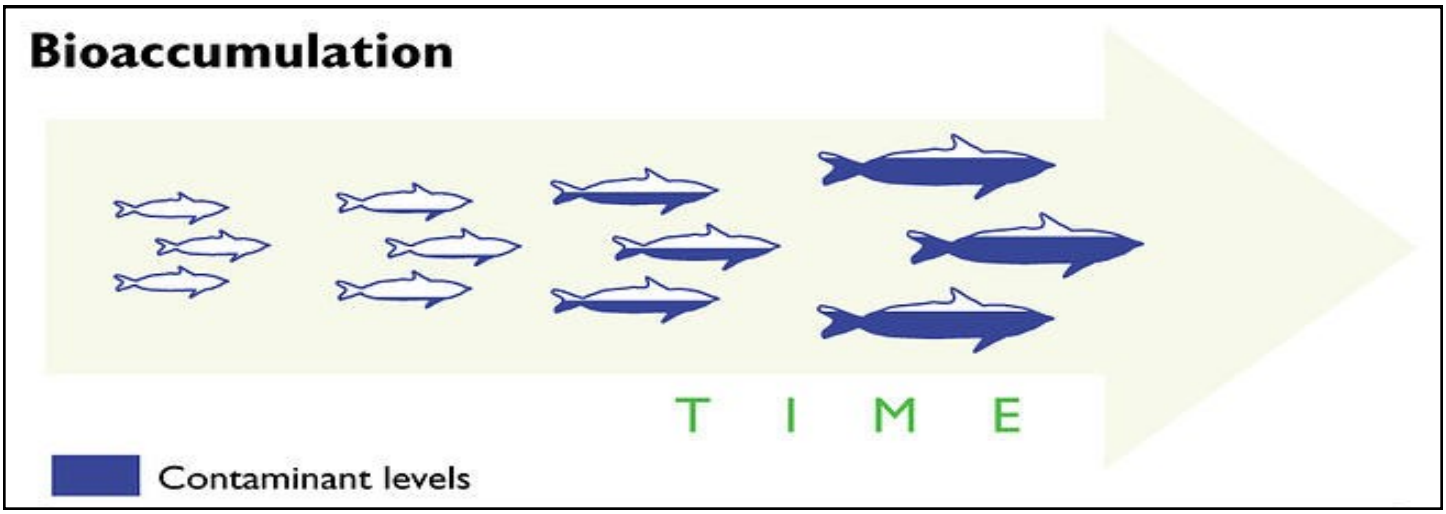
Because they are at the top of the food chain, dolphins accumulate more toxins in their bodies than the animals lower in the food chain. Animals at the bottom of the food chain, like aquatic plants and bottom feeders, contain low levels of contaminants, whereas animals at the top of the food chain, who eat animals at the bottom of the food chain, contain much higher levels of contaminants in their bodies. **Bioaccumulation** is the word used to describe the process of contaminants building up in animals' tissues over time (see image below).

Recent studies have shown that concentrations of polychlorinated biphenyls (PCBs) in Brunswick dolphins are ten times higher than the polychlorinated biphenyl concentrations in dolphins found in the Savannah area. Studies from the last five years have shown that Atlantic bottlenose dolphins are already being harmed across multiple generations by polychlorinated biphenyls. Dolphins play an important role in the Brunswick ecosystem and should be a central consideration in the Proposed Plan.

Atlantic bottlenose dolphin
Photo: Sarasota Dolphin Research Program

Thin-cover placement

Thin-cover placement, which is also called enhanced natural recovery in the Proposed Plan, is not a sustainable recovery method. By nature, the layer of sediment will be thin, six inches or less, and will not be adequate to contain any contaminants in the marsh bed. A thin-cover layer is easily disturbed. For example, a storm surge could easily move the sediment around, as could the bottom of a boat passing by. In addition, animals living in the marsh like crabs and worms will burrow into sediment and disturb the layer.



The process of bioaccumulation through the food chain over time Photo: whalefish.org

Human Health and Ecological Risk Assessments
The Human Health Risk Assessment in the Proposed Plan does not adequately account for the risks posed by the contaminants to humans at the Estuary site. The two chemicals causing the most harm are mercury and a mixture of polybrominated biphenyls known as Aroclor 1268. The Plan defines a high quantity fish consumer as an adult who eats 40 fish meals per year for 30 years, and a recreational fish consumer as someone who eats 26 fish meals per year for 30 years. The difference between the two consumer categories is small and the fish consumption numbers should be increased based on detailed surveys of local fishermen.

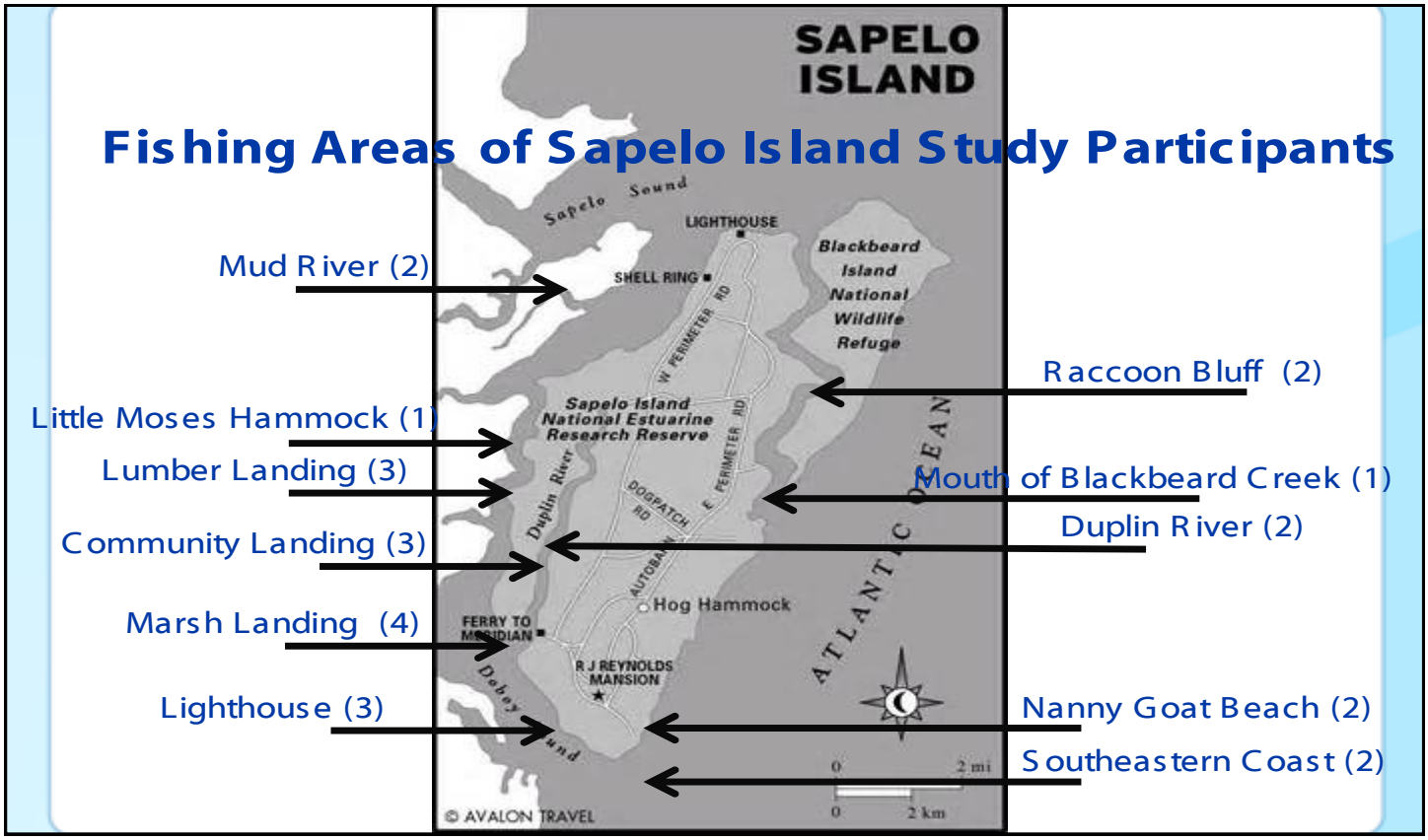
In the Ecological Risk Assessment, one of the sites used to compare the levels of chemicals in the sediment at LCP is only four miles from the LCP site at Troup Creek and has shown to be contaminated with the same chemicals. Another cleaner site should be used instead.

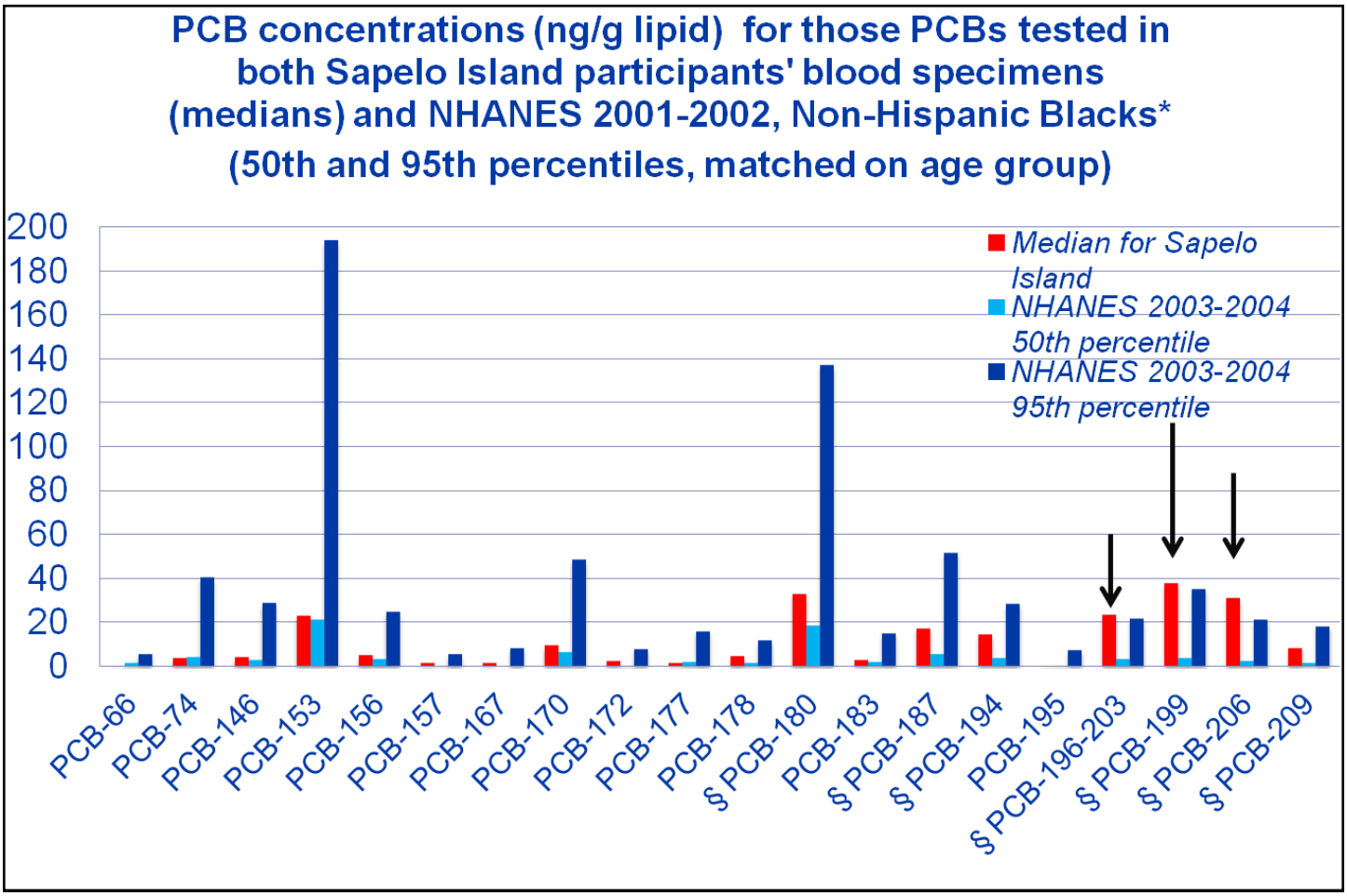
Total Acreage of Cleanup
To cleanup the marsh to a level protective of human and environmental health, 81 acres of marsh would need to be cleaned up. However, the chosen cleanup plan will only cleanup 24 acres of marsh, leaving behind 57 acres with high levels of mercury and polychlorinated biphenyls (PCBs).

Red fish or spot tail bass, a fish native to waters of Brunswick Photo: chesapeakebay.net

Sapelo Island

Sapelo Island is a state-protected barrier island north of Brunswick. The Agency for Toxic Substances and Disease Registry recently conducted a study that showed that residents of Sapelo Island have dangerously high levels of PCBs in their bodies, based on their blood samples. Scientists conducting the study sampled nine residents, ages 21-74. All the residents stated that they ate two to three meals of locally-caught seafood per week, and had eaten locally-caught seafood for over five years. See the map below of where the study participants went fishing.





The red bars are the median sample for the Sapelo Island residents. Notice the three samples with the arrows above them, which point to Sapelo Island blood samples that were above the 95th percentile for PCB levels in blood. Source: Presentation given by the Agency of Toxic Substances and Disease Registry

When the results of the blood tests were compared to samples from non-Hispanic African Americans throughout the country, some of the PCB levels in blood of the Sapelo Island residents were above the 95th percentile. In addition, when the Sapelo residents' samples were compared to the samples from local Atlantic bottlenose dolphins, scientists found that the human and dolphin samples contained similar environmental contaminants. This shows that contaminants from the LCP Chemicals Site have migrated into the waters and sediment surrounding Sapelo Island, into the local seafood, and finally, into the bodies of local residents who eat the local seafood.

A copy of the powerpoint presentation can be found on the GEC website at www.glynnenvironmental.org.

Public Meeting

A public meeting with the EPA is scheduled for December 4, 2014 at 6:00 PM at the Brunswick-Glynn County Library, 208 Gloucester Street, Brunswick, GA 31520. The EPA will present information on the site and explain the reasoning for choosing Alternative 6 for the cleanup. Oral and written comments will be accepted at the meeting.

View the full Proposed Plan at the GEC website at www.glynnenvironmental.org.

Public Comment Period

The public comment period for the Proposed Plan will last from December 4th, 2014 to February 2nd, 2015. Comments can be submitted to the EPA by email or via postal mail.

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White heron—Photo: Altamaha Riverkeeper

LCP Chemicals Superfund Site
Marsh Proposed Plan
EPA Public Hearing

December 4, 2014 at 6:00 PM at the Brunswick-Glynn County Library, 208 Gloucester St., Brunswick, GA 31520.

For more information, contact the Glynn Environmental Coalition:

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