

# EXHIBIT 20

## Hudson River PCBs Superfund Site

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Date: May 12, 2006

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Subject: Response to questions on shoreline slope, PCB mass for removal in River Section 1, and shoreline Total PCB inventory remaining

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### Introduction

This memo explains the basis for the estimates of: (1) PCB mass remaining within 10 feet of shore in the Phase 1 areas following application of the approach to dredging in near-shore areas as set forth in the CDE; (2) the PCB mass to be removed in River Section 1; and (3) the average shoreline slopes in River Sections 1, 2 and 3. The information was largely obtained through discussion with the Earth Tech staff that performed the original work.

### 1. Calculation of shoreline inventory remaining

The total PCB mass remaining within 10 feet of shore has been estimated as less than approximately 1 percent of the mass targeted for removal in RS 1 (approximately 900 kg Total PCB mass within 10 feet from the shoreline vs. 61,300 kg in RS 1). This inventory remaining was previously reported as approximately 850 kg by rounding of this estimate. The 61,300 kg was estimated from a polygonal declustering analysis of the data, which is addressed as item 2 of this memo.

The estimate of the inventory remaining was done using the data collected as part of GE's design sampling program and the Thiessen polygon declustering method (see Figure 1). These estimates are based on the Sediment Sampling and Analysis Plan (SSAP) database from summer 2005 which contained very limited data within the 10 ft boundary. As a result, samples further offshore formed the primary basis for the estimation of the inventories within 10 ft of shore. Using the GE data, mass per unit area (MPA) was estimated at each location, and Thiessen polygons were created to determine the area of influence of each sample location. These polygons were clipped<sup>1</sup> to the dredged areas, and a 10-foot boundary from the 5,000 cubic feet per second (cfs) shoreline (*i.e.*, the shoreline when the river is flowing at a rate of 5,000 cfs) was created for each dredge area. The total PCB mass was calculated by applying the sample location MPA to its polygon area of influence within the 10 ft boundary. The total PCB mass remaining within the 10 ft boundary after dredging was estimated as the mass below 2 ft for the cores whose polygons extended into the 10 ft area, regardless of the

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<sup>1</sup> "Clipped" refers to the selection process whereby only those polygon areas contained within the boundaries defined by GE's Phase 1 and preliminary Phase 2 areas and the 10 foot boundary off shore were retained for the calculation.

proximity of the cores themselves. The contribution from each core was weighted by the area of each core's polygon that was contained within the 10 ft boundary. The additional reduction in this volume that would occur due to the application of the 3:1 depth of cut from the shore was ignored for conservatism in recognition of the other uncertainties in this estimation.

## **2. PCB mass estimated to be removed in River Section 1**

The total PCB mass to be removed in River Section 1 is approximately 61,300 kg. This estimate was made using the SSAP January 2005 database. The inventory was estimated from the mass per unit area for each core and the Thiessen polygon declustering method. Polygons were derived for all of River Section 1. To estimate the mass to be removed, these polygons were clipped to GE's final Phase 1 dredge boundaries and preliminary Phase 2 dredge boundaries. The total PCB mass to be removed in River Section 1 for both phases (*i.e.*, 61,300 kg) was calculated by multiplying the MPA for each core by its associated polygon within the dredge boundaries and summing the resultant products.

## **3. Calculation of average shoreline slopes for RS 1-Phase 1, and RS 2 and 3.**

The shoreline slope in the Phase 1 target areas is estimated at 6.5:1 or shallower for 50 percent or more of the near-shore dredge areas and 4:1 or shallower for 90 percent or more of the dredge areas.

The slope was estimated in River Section 1 using GE's 2001 single beam bathymetry contours. GE generated these contours from single beam bathymetry data. Two points were identified at 82 locations near the shore within Phase 1 dredge areas along the 1-ft and 2-ft bathymetric contours. The distance between the contours and the surface elevation of the contours provide the estimates of slope. These points are typically some close distance from the 5,000 cfs shoreline and provide the best estimate of the slope currently available. In River Sections 2 and 3, the raw data from the single beam bathymetric surveys were utilized. In these areas, two points were selected at 30 locations on bathymetric cross sections which fell within dredge areas. The distance between points and the difference in elevation was used to estimate the slope. To the extent possible, the points on the cross sections were selected to be close to shore. Again, the point data are typically some close distance from the 5,000 cfs shoreline, but provide the best estimate of the slope currently available. The average slope calculations described above were estimated for the shoreline only and not for the entire river bottom.

**Figure 1**

Mass within a given distance from shore (e.g., 10 ft) is the sum of the products of the MPA value and its associated polygon area contained within the contour, the shoreline and the dredge boundary. Cores were not limited by shoreline proximity.

