

Executive Summary

Objectives

This *Sediment and Surface Water Study Report* provides the results of the investigation conducted in the Patapsco River near Dundalk Marine Terminal (DMT) in Baltimore, Maryland. The investigation was conducted pursuant to the requirements of Section III.B.3 of the April 5, 2006, Consent Decree entered into by and among the Maryland Department of the Environment (MDE), the Maryland Port Administration (MPA) and Honeywell International Inc. (Honeywell). Sampling activities were conducted in accordance with the *Final Sediment and Surface Water Study Work Plan* (Work Plan) (CH2M HILL and ENVIRON, 2007a).

The objectives of the sediment and surface water study were to:

- Characterize the nature and extent of chromium in the Patapsco River within the zone potentially impacted by chromium releases at or from DMT; and
- Characterize the geochemical conditions that influence the fate and transport of chromium in the river.

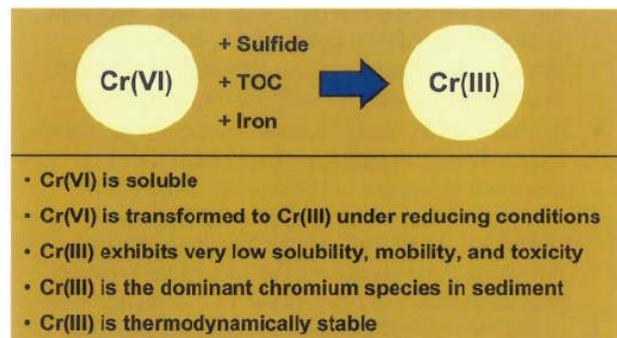
The data collected as part of this study are extensive and sufficient to support the conclusion that the nature and extent of chromium in the Patapsco River and Colgate Creek are delineated, in accordance with the approach defined in the Work Plan, and as such, this study meets the requirements as stipulated in the Consent Decree.

Investigative Approach

The approach identified for the evaluation of chromium fate and transport follows the U.S. Environmental Protection Agency's (USEPA) Equilibrium Partitioning (EqP) approach for chromium (USEPA, 2005a), which is illustrated in Figure ES-1.

The field program for the DMT sediment and surface water study was composed of four quarterly sampling events in May, August, and December 2007 and February 2008 to ensure characterization of seasonal differences in geochemical conditions that govern chromium speciation. Sampling locations are shown in Figure ES-2.

FIGURE ES-1
Summary of USEPA's Equilibrium Partitioning Approach for Chromium



Conclusions

The objectives of the Surface Water and Sediment Investigation have been satisfied with the following findings:

- Hexavalent chromium (Cr(VI)) was not detected in pore water in any of the samples taken from DMT in any of the four quarterly sampling events;
- Cr(VI) was not detected in 97 percent of the surface water samples analyzed; in those limited locations where it was detected, concentrations were well below the USEPA's Nationally Recommended Water Quality Criteria (NRWQC);
- Measurements of geochemical parameters in pore water, surface water, and sediment demonstrate that conditions are favorable to the presence of chromium as the relatively nontoxic trivalent chromium species (Cr(III)) rather than Cr(VI); and
- Based on the results of this study and other related studies with respect to chromium geochemistry, total chromium in sediment is unlikely to oxidize to Cr(VI) in the future because the geochemical conditions necessary for this process do not naturally occur in the estuarine environment.

In summary, the DMT data are extensive and sufficient to support the conclusion that the nature and extent of chromium in the Patapsco River and Colgate Creek are delineated, in accordance with the approach defined in the Work Plan, and as such, meets the requirements as stipulated in the Consent Decree. No additional sampling is required to complete the sediment and surface water characterization, or support the human health and ecological risk assessments for the Patapsco River and Colgate Creek adjacent to DMT.

FIGURE ES-2
DMT Sediment and Surface Water Study Sampling Locations

