

Characterization of the Particulate Emissions from the BP Deepwell Horizon Spill Surface Oil Burns

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ABSTRACT

A particle sample gathered from the plume of the purposely-burned surface oil during the BP Deepwater Horizon disaster in the Gulf of Mexico was analyzed for polycyclic aromatic hydrocarbons (PAHs), organic acids, organic carbon (OC), elemental carbon (EC), metals, and chloro-organics, including polychlorinated dibenzodioxins/dibenzofurans (PCDDs/PCDFs). Emission factors were estimated based on carbon capture from background-adjusted CO₂ and PM-bound C. The Total PM emission factor was 75 g/kg oil burned. The mean of five thermal-optical analyses indicated that the burned crude oil particulate matter was 95% carbon (w/w) with the predominance being refractory elemental carbon (82% w/w). PAHs accounted for roughly 60 ug/g of the PM mass or 4.5 mg/kg oil burned. The PCDD/PCDF concentration of the PM was 1.5 to 3.3 ng TEQ/kg oil burned, consistent with earlier analysis of a dedicated gas/solid sample.