

Analysis and modeling of airborne BTEX concentrations from the Deepwater Horizon Oil Spill.

Avens H., K.M. Unice, J. Sahmel, S. Gross, J. Keenan, and D. Paustenbach.

Concerns have been raised about whether Deepwater Horizon oil spill cleanup workers experienced adverse health effects from exposure to airborne benzene, toluene, ethylbenzene, and xylene (BTEX) which volatilized from surfaced oil. Thus, we analyzed the nearly 20,000 BTEX measurements of breathing zone air samples of offshore cleanup workers taken during the six months following the incident (made publicly available by British Petroleum). The measurements indicate that 99% of the measurements taken prior to capping the well were 32-, 510-, 360-, and 77-fold lower than the U.S. Occupational Safety and Health Administration's Permissible Exposure Limits (PELs) for BTEX, respectively. BTEX measurements did not decrease appreciably during the three months after the well was capped. Moreover, the magnitudes of these data were similar to measurements from ships not involved in oil slick remediation, suggesting that the BTEX measurements were primarily due to engine exhaust rather than the oil slick. To supplement the data analysis, two modeling approaches were employed to estimate airborne BTEX concentrations under a variety of conditions (e.g., oil slick thickness, wind velocity). The modeling results corroborated that BTEX concentrations from the oil were well below PELs and that the oil was not the primary contributor to the measured BTEX.