C52 Contaminant Release Dating Continued - Can Sediment Core Analyses Be Used to Date Contaminant Releases?

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After attending this presentation, attendees will understand the utility and limitations of sediment core analyses to determine contaminant release dates.

This presentation will impact the forensic community and/or humanity by demonstrating a real world example of the integration of chemistry, fate and transport theory, hydrology, bathemetry, construction management, storm water management and monitoring, GPS, and historical aerial photographs to determine contamination release dates in a complex scenario.

Contaminant release dating is an important and challenging part of environmental forensics. A determination of when contaminants were released to the environment plays a critical role in liability determinations and remedial cost allocations.

In an earlier paper, presented to the American Academy of Environmental Forensics, the merits of several approaches to contaminant release dating were assessed. This presentation continues the analysis with a focus on surface water sediment contamination and associated contaminant release dating.

An environmental forensics analysis was conducted to determine the source of DDT contamination that is seen today in the sediments of an estuary on the Gulf Coast. DDT was produced at a manufacturing facility that ultimately discharged to the estuary. The production of DDT ceased at this facility in 1970 and the plant changed ownership in the early 1980s. The estuary is tidal and is routinely subjected to tug and barge traffic. Intense rainfall and storm events were not uncommon.

Clearly, the DDT that is seen in the estuary sediments was most likely produced when the plant was manufacturing DDT. The presence of DDT at depth in several sediment cores was presented as evidence that the DDT contamination was “old” and consequently due to releases that occurred during the time when DDT was being manufactured. However, there are several reasons that suggest that the DDT was released later after the plantchanged ownership.

The presentation will provide the results of a detailed environmental forensics analysis that included the evaluations of sediment quality at different locations over time, bathymetric surveys over time, dredging events that removed large volumes of potentially contaminated sediments during DDT plant operations, and the analysis of construction projects, that occurred after the ownership change that had the potential to release large amounts of highly contaminated surface and subsurface soils to the estuary.

Release Dating, Sediment Cores, DDT Contamination

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