

## Environmental Forensics: Applications for the Railroad Industry

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Environmental forensics has been defined as the systematic and scientific evaluation of physical, chemical, and historical information for the purpose of developing defensible scientific and legal conclusions regarding the source or age of a contaminant released into the environment. The nature of the railroad business includes the transport and distribution of numerous materials that are considered environmental contaminants. Additionally, railyards and railways are mainly located in highly industrialized areas where historical contamination may be present. In the event of a contaminant release at a railyard or depot an understanding of the interplay between legacy contaminants and newly released contaminants is critical for both fiscal and environmental responsibilities.

This presentation focuses on the environmental forensic tools that are available to distinguish between contaminant sources and time of release including:

- Age dating and source identification of petroleum hydrocarbons.
- Source identification of chlorinated solvents.
- Compound Specific Isotope Analysis (CSIA) fingerprinting.
- Signature chemical analysis.
- Contaminant modeling.
- Multivariate statistical techniques.