

Course Outline for Environmental Forensics, Session 1, March 10, 2022, 10 am – 2:15 pm

Environmental Forensics of Hydrocarbon Chemicals: Survey of Applications, Approaches, Capabilities, and Limitations

10:00-10:30 AM What is Environmental Forensic Science

- Goals and applications
- General approaches to a site-specific environmental forensic study

10:30-11:15 AM The Nature of Hydrocarbons and Common Petrogenic and Pyrogenic PAH Sources

- Petrogenic substances (petroleum products)
- Pyrogenic substances (tar, creosote, pitch, incomplete combustion)

Q&A

11:15-11:45 AM Environmental Chemical Transport and Fate of Petroleum and Coal Tar

- Why is it important for forensics?

11:45-12:15 PM 30 minute Break

12:15-1:00 PM Sampling Considerations, Analytical Methods, and Quality Control

- How many samples?
- Where?
- GC and GC/MS methods
 - Comparison of forensic methods to conventional methods
- QA/QC issues and their impact on source identification

Q&A

1:00-2:00 PM Fingerprints, Ratios, and Other Data Analysis

- What can you do with conventional investigation data?
- Case Study 1: Identify the source of No. 6 heating oil release to a sewer
- What is done with typical environmental forensic data?
 - Ratios, statistics, chemometrics
 - Quantitative chemical fingerprinting – how confident am I?

- Case Study 2: Identify and quantify the sources of BTEX and PAHs in sediment near a petroleum storage facility and former MGP site

2:00-2:15 PM Miscellaneous Hydrocarbon Topics

- Age dating
- Case Study 3: Characterize the nature and age of gasoline impacts near a service station
- Historic Fill

Q&A

2:15 PM

Adjourn