



Engineering Sciences Section - 2013

C5 Environmental Chemistry

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After attending this presentation, attendees will have a better understanding of a chemist's role in environmental litigation.

This presentation will impact the forensic science community by focusing on the expert's qualifications instead of the general area of competence.

The essence of the litigation is based on forensic environmental chemistry dealing with questions such as:

- Who released the chemicals of concern (i.e., those substances perceived to harm human health or the environment)?
- How did the release occur?
- What manufacturing process or function produced the contaminant(s)?
- When did the releases occur (age-dating environmental contaminants)?

The answers to these questions must be found in the data from the site investigation of the contaminants in the various matrices, the fate and transport of the chemicals in these matrices based on peer-reviewed literature, and the fundamentals of chemistry and physics. The forensic scenario that is built by the expert witness should be logical and thoroughly based on the documents provided in the case, the chemical data that was obtained during the site investigation and that has been provided, and the chemical literature.

A case in point concerns chemistry and an environmental matrix such as groundwater. Is a chemist allowed to testify about chemicals in groundwater including their fate and transport? The attorney stated during *voir dire* of a chemist that fate and transport of chemicals in groundwater can only be addressed by an expert hydrogeologist. A chemist is not capable of determining the direction of groundwater flow nor its velocity. The use of tracer chemicals is not in the chemist's toolbox for the determination of the source of groundwater contamination nor where chemicals are transported by groundwater. The fate of chemicals in groundwater is for the hydrogeologist to interpret and opine upon. A chemist can discuss chromatography but cannot opine on the retention of chemicals in an aquifer.

A judge as a gatekeeper must decide if a chemist can or cannot testify at trial about the fate and transport of chemicals in groundwater. This is a new question and it does not consider the expert's qualifications but does consider the definition of the area of expertise.

Environmental Chemistry, Fate & Transport, Hydrogeology