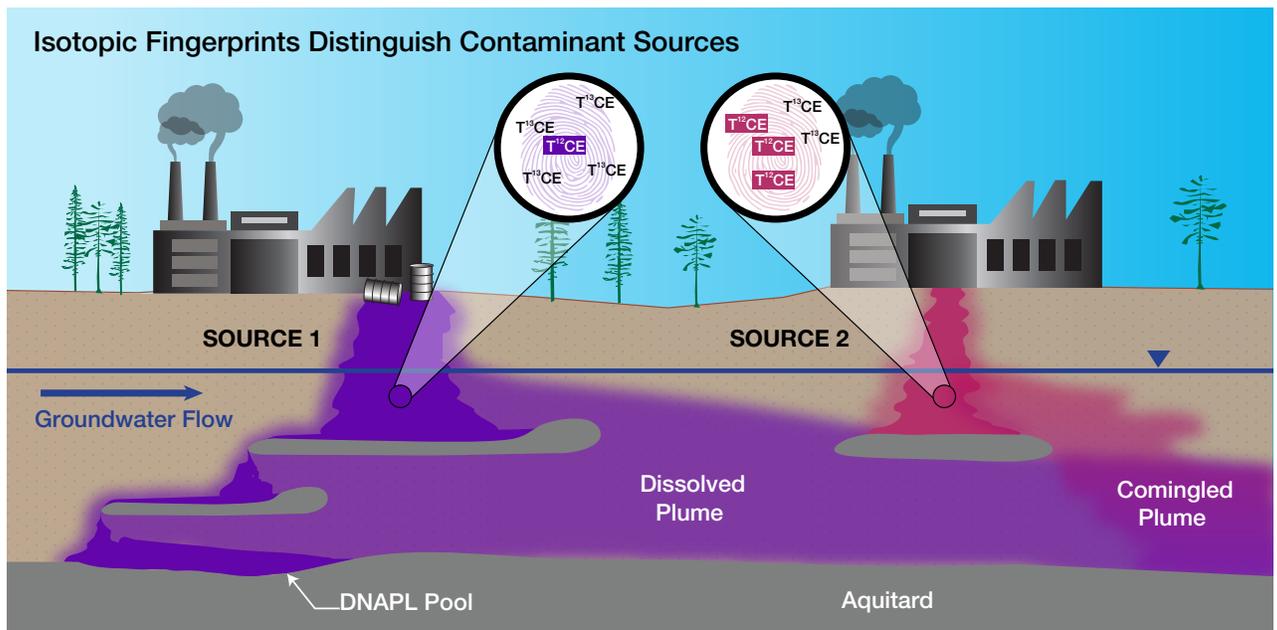


The application of stable isotope tools, such as Compound Specific Isotope Analysis (CSIA), can provide a powerful line of evidence to answer forensic questions pertaining to groundwater contaminant source apportionment, chemical trespass, and documentation of contaminant degradation. CSIA measures the natural occurrence of stable isotopes of a specific compound (i.e., TCE) in environmental samples and can be more conclusive than conventional chemical data allowing for refined source and degradation information. The application of CSIA at contaminated sites has the potential to: identify the number of contaminant sources and distinguish between them; assess the extent of contaminant degradation

and mechanisms of; and evaluate natural versus synthetic sources.

To ensure appropriate use in legal matters and under Federal Rule 702 and *Daubert*, judges, lawyers, and technical practitioners need to understand the capabilities and limitations of this tool, as well as admissibility, reliability, and validity of this isotopic evidence. This presentation will discuss the fundamental principles and methods of CSIA in the context of the *Daubert* criteria. Case studies will be presented to demonstrate where challenges to isotopic evidence might be made. It will also outline considerations for successful application of CSIA for legal matters - making data defensible and admissible.



**Technical Roundtable Presentation**

*Thursday, October 6, 2016 ~ 1:30-2:00 PM*

*The ABA Section of Environmental, Energy, and Resources Law*

*24th Fall Conference, Denver, Colorado*





Geosyntec Consultants is a consulting firm with engineers, geologists, environmental scientists, and other technical and project staff based in offices throughout the United States and at select locations in Australia, Canada, Ireland, Malaysia, and the United Kingdom. We address new ventures and complex problems involving our environment, natural resources, and civil infrastructure.

## Silvia Mancini, Ph.D., P.Geo.

Project Geoscientist

Geosyntec Consultants – Toronto, Canada

Dr. Silvia Mancini, Ph.D., is a Project Geoscientist in the remediation group of Geosyntec Consultant's Canadian operations, based in the Toronto office. Silvia obtained a doctoral degree from the University of Toronto focusing on using Compound Specific Isotope Analysis (CSIA) as an environmental forensics and diagnostic tool to evaluate sources and degradation of organic contaminants in groundwater systems. She serves as a subject matter expert focusing on forensics for site characterization, remediation projects, and litigation matters. Dr. Mancini has expertise specifically related to isotope forensics of petroleum hydrocarbons, chlorinated solvents, and chlorinated aromatics. Silvia is an internal practice leader of Geosyntec's Environmental Forensics and Diagnostics Practice Group.

Silvia's consulting experience includes providing expert opinions/peer reviews in environmental litigation cases, developing site characterization programs for source investigations using innovative tools, designing and implementing remediation programs for industrial/commercial sites, and managing Environmental Site Assessments (ESAs) in accordance with the applicable regulatory framework,

Silvia is an author of 13 journal articles in her field of expertise and a chapter in a textbook entitled "Environmental Isotopes in Biodegradation and Bioremediation". She is sought out as a speaker both within the United States and internationally at conferences and has provided seminars on the use of CSIA for environmental forensics of organic contaminants to regulatory agencies. Silvia is actively involved in teaching and research initiatives through University collaborations and is currently extending stable isotope forensics to heavy metals such as mercury. In recognition of her academic and professional experience, Silvia was appointed a position as an industry representative on the Natural Sciences and Engineering Research Council of Canada (NSERC) Strategic Panel (2009-2012), which evaluated environmental sciences and engineering grant applications nationally.



- Stable Isotope Geochemistry
- Environmental Forensics
- Soil and Groundwater Remediation
- Litigation Support

SPECIALTIES

- Ph.D., Geology (Stable Isotope Geochemistry), University of Toronto, Toronto, 2007
- M.Sc., Geology (Stable Isotope Geochemistry), University of Toronto, Toronto, 2002
- B.Sc. (Hons), Biological Sciences (Biology), University of Toronto, 2000

EDUCATION