



## Miriam Tuzzio

Project Scientist

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### Expertise

- Historical research and technical evaluation for litigation support
- Soil sampling
- Design and implementation of environmental study
- Geographic Information Systems
- R statistical computing software
- Environmental assessments

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### Summary

Ms. Tuzzio is a staff scientist with five years of experience in environmental investigations, remediation, and litigation projects. She has expertise in ecological assessments, preparation of technical reports, and laboratory procedures and methodologies. She has conducted historical and property research in association with due diligence and litigation support as well as research to support the production of environmental impact site assessment reports.

Additionally, Miriam is proficient in ArcGIS and R Statistical Software as well as the use and maintenance of various field and laboratory equipment.

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### Professional Experience

#### **Expert Consultant for Sediment and Uplands Cleanup Cost Allocation (2019–Ongoing)**

Confidential Client, New York

TIG Environmental provides litigation support to a private client participating in a Superfund site allocation. The site includes nearly two miles of waterway in a heavily industrialized area of New York state. Contamination at the site includes polychlorinated biphenyls (PCBs) and other chemicals, but PCBs are the primary chemicals of concern. After an initial remedial design phase was completed, regulatory agencies required additional investigation of the study area. Findings from the investigation increased the estimated remedial cost nearly seven-fold. A comprehensive assessment of the watershed is necessary. The client retained TIG Environmental's services for potentially responsible party (PRP) identification and investigation, sampling and data analysis, and expert witness testimony for anticipated cost allocation for remediation of sediments. Since 2019, TIG Environmental evaluated and investigated documents for PRP sites to gather evidence of historical releases related to operations, developed a conceptual site model of the relationships between PRP operations and the contaminated waterway, conducted soil and sediment sampling, and completed forensic data analysis to identify sources of PCB contamination. TIG Environmental also provided and continues to maintain data visualization tools to assist the client in strengthening the connection between contamination in the waterway and adjacent PRPs, identifying PRPs that may not be responsible for contamination, and identifying additional discharge points that may be associated with additional PRPs.

Ms. Tuzzio serves on the technical team conducting detailed analyses of environmental documents, lease agreements, deed transfers, and historical photographs. Ms. Tuzzio writes site-specific reports following detailed review of historical documentation regarding PRP sites. In these reports, she aims to characterize the likelihood that a PRP site has contributed PCB contamination to the waterway.

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**Technical Consultation and Allocation/Litigation Support (2018–Ongoing)**

Confidential Client, Multnomah County, Oregon

TIG Environmental provides technical expert support for environmental liability assessment and cost allocation for the remediation of sediments in the Portland Harbor Superfund Site, and for the associated Natural Resource Damages claims. The harbor has been the site of numerous industrial and manufacturing operations for more than a century, including shipbuilding, petroleum storage and distribution, metal salvaging, and electrical power generation. Technical support for this project includes research, sampling, and forensic analysis to determine the specific contaminants associated with activities or facilities. The project also includes evaluating potential historical contaminant sources, determining contaminant fate and transport, and chemical fingerprinting polycyclic aromatic hydrocarbons (PAHs) and PCBs.

Since 2018, Ms. Tuzzio has served on the technical team conducting detailed analyses of environmental documents, lease agreements, deed transfers, and historical photographs to identify new PRPs. Ms. Tuzzio has written site-specific reports for a specifically designated location pursuant to the client's request following detailed review of historical documentation regarding PRP sites. In these reports, Ms. Tuzzio aims to characterize the likelihood that a PRP site has contributed to contamination in the system and compiles available evidence that can be used to quantify this contribution in an allocation framework.

Ms. Tuzzio has also performed task management duties including budgeting and scheduling relating to the production of allocation related work product.

**Technical Support of Cost Allocation (2018–Ongoing)**

Confidential Client, New Jersey

TIG Environmental provides technical support on investigative identification of PRPs in a tidal tributary system with contaminated sediments for remedial cost allocation purposes. The evaluation includes research and forensic analysis to determine the nexus from investigated upland PRP sites to the tributary system for specific contaminants. The results of this investigation were used to develop a comprehensive allocation strategy and supporting expert reports for sediment and marsh cleanup cost allocation.

Since 2018, Ms. Tuzzio has served on the technical team conducting detailed analyses of environmental documents, lease agreements, deed transfers, and historical photographs. Ms. Tuzzio has written site-specific reports for a specifically designated location pursuant to the client's request following detailed review of historical documentation regarding PRP sites. In these reports, she aims to characterize the likelihood that a PRP site has contributed to contamination in the system and compiles available evidence that can be used to quantify this contribution in an allocation framework.

**Technical Support of Cost Allocation (2018–Ongoing)**

Confidential Client, New York

TIG Environmental provides technical support regarding cost allocation for a Superfund site involving remediation of sediments contaminated with PAHs, PCBs, non-aqueous phase liquids (NAPLs), and metals. The effort includes historical research to understand the operational history of various

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industries adjacent to the waterway since the late 1800s, including the specific processes used at each facility. TIG Environmental evaluates documents provided by PRPs and obtains other relevant information from historical media sources, archives, and a variety of records repositories. This research focuses on the specific processes used at each facility, including types and quantities of raw materials used, waste materials generated, and type and duration of discharges. TIG Environmental completed expert reports to detail each PRP's nexus with activities that caused releases of hazardous substances contributing to response costs and provided similar reports and rebuttal testimony regarding the client's historical operating facilities. TIG also assists in developing allocation strategies used to secure a favorable outcome for the client.

Ms. Tuzzio serves on the technical team reviewing documents in support of the ongoing environmental litigation.

**Technical Consultation and Litigation Support (2018–Ongoing)**

Confidential Client, New Jersey

TIG Environmental provides technical and litigation support for environmental liability assessment related to sediment remediation at a complex urban river Superfund site in northern New Jersey. Investigative services performed include acquisition of historical records, conducting witness testimonies, reviewing environmental data, and developing expert technical reports for the identification and assessment of PRPs who contributed to the contamination of the Superfund site. Contaminant source identification involves evaluation of the historical operations of hundreds of PRPs at upland sites, fate and transport analysis, and investigation and mapping of historical direct and indirect sewer discharges. TIG Environmental manages a database and client accessible data visualization platform encompassing all historical sampling data collected at the Superfund site.

Ms. Tuzzio serves on the technical team conducting detailed analysis of environmental documents, lease agreements, deed transfers, and historical reports. She also has updated site-specific reports with new available information including chemical marker analyses. Ms. Tuzzio has conducted extensive file reviews for numerous PRPs pursuant to the Open Public Records Act and Freedom of Information Act. The findings of this research have been summarized in reports that evaluate the potential relationship between activities conducted on sites of interest and contamination in the Passaic River.

**Technical Consultation and Allocation/Litigation Support (2018–Ongoing)**

Confidential Client, New Jersey

TIG Environmental provided technical support for environmental liability assessment and cost allocation for an upland Superfund site involving soil and groundwater, on an accelerated schedule. Development of a proposed cost allocation strategy on behalf of the client included evaluation of environmental data and technical reports, witness testimony, and historical records. The effort included research and forensic analysis of potential historical contaminant sources, other potentially responsible parties' (PRPs') contaminant contributions, industrial archeology/chemical processes, and contaminant fate and transport. TIG Environmental used allocation modeling, calculations, and statistical analyses based on the data generated from this

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research to assist the client in decision-making on numerous allocation scenarios among the approximately 60 PRPs. TIG Environmental authored position papers to support the client in both offensive and defensive positions.

Ms. Tuzzio reviewed documents to identify PRPs in support of the ongoing environmental litigation.

**South Park Marina Remedial Action (2018–Ongoing)**

South Park Marina Limited Partnership, Seattle, Washington

TIG Environmental is assisting the owner of a recreational marina site in the South Park neighborhood of Seattle, Washington. This site is the subject of remedial action under a Washington State Department of Ecology (Ecology)-Administered Agreed Order. Soil and groundwater at the site are contaminated with polychlorinated biphenyls (PCBs), petroleum hydrocarbons, volatile organic compounds, pesticides, and metals requiring cleanup under the Washington State Model Toxics Control Act (MTCA). TIG Environmental's work includes investigation of historical sources of contamination both on- and off-site. As a result, TIG Environmental identified and nominated additional potentially liable persons (PLPs) for release(s) of hazardous materials affecting the Site to Ecology. These PLPs are now involved as participants under the Agreed Order. TIG Environmental, on behalf of South Park Marina Limited Partnership, and the other PLPs are working in partnership to oversee the completion of the tasks required to be performed under the Agreed Order: remedial investigation (RI) work plan, RI field activities, source control evaluation, and RI Report. TIG Environmental has completed several source control, remedial investigation (RI), feasibility study (FS), and preliminary engineering design tasks supportive of efforts under the current Agreed Order and/or future formal program designations.

Ms. Tuzzio serves on the technical team reviewing primary documents and allocation team work product in support of the ongoing environmental litigation.

**Principal Researcher (2016–2017)**

Master's Thesis, New Hampshire

Ms. Tuzzio conducted a study for her master's thesis to determine the effects of road salts on terrestrial salamanders in southwest New Hampshire. She led the project throughout including literature reviews, proposal submittals, and study design and implementation. Thirty sites were assessed and considered for this study and the laboratory component of this research involved testing soil samples collected from the selected field sites. Electrical conductivity was used as a proxy for road salts; to that end, laboratory equipment was vital to the success of this study and used to determine the pH and electrical conductivity of each sample.

Ms. Tuzzio used ArcGIS to prepare maps and figures that were necessary for study design preparations and presentation of the data she collected and data available in online repositories. R statistical computing software was used extensively to conduct all statistical analyses and create figures to represent the data gathered.

**Technical Consultation Support for Environmental Impact Assessment (2015)**

Town of Merrimack, New Hampshire

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Moosewood Ecological is a small environmental consulting business based in southern New Hampshire. This company has been operating since 2002 with a focus on environmental conservation. Clients have included federal and state agencies as well as conservation commissions, watershed associations, land trusts, and private landowners. Moosewood Ecological provides expert investigations in natural resources inventories and species biodiversity using various trapping, tracking, monitoring, and assessment techniques.

Ms. Tuzzio was integral in the data collection and research components of a project investigating the potential environmental impacts of a gas pipeline installation through a powerline right-of-way located within a 500-acre nature preserve. Research included review and analysis of documentation relating to pipeline installation as well as mapping of over 30 vernal pools, trapping of state threatened and endangered turtle species, and radiotracking select turtles to determine connectedness of the various water bodies on the site.

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**Scholastic Experience**

**Coastal Geoecology Course (2015)**

Ms. Tuzzio travelled to Cape Cod, Massachusetts to study coastal beach erosion and salt marsh ecology. Through this course, she became familiar with techniques focused on coastal salt marsh restoration and coastal change monitoring.

**Wetlands Ecology Course (2016)**

This course focused on the various wetland habitats found in New Hampshire. Ms. Tuzzio visited numerous wetland habitats including bogs, salt marshes, rivers, and vernal pools. She studied the functions of each ecosystem and the remedial concerns faced by each habitat. Furthermore, she was given training to conduct wetland delineations and wetland assessments.

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**Academic Qualifications**

MS in Environmental Studies, concentration in Conservation Biology, Antioch University New England, 2017

BS in Environmental Science, Union College, 2012

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**Professional Training**

- Trained in tracking and trapping techniques
- Trained in proper laboratory methodologies
- ArcGIS
- R Statistical Computing Software
- 40-Hour OSHA Hazardous Waste Operations (HAZWOPER) Training
- CPR, First Aid, and AED Training