

## CURRICULUM VITAE

**Lisa N Kates, PhD**

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### Profile

Dr. Kates is an environmental forensic chemist, contracted to Chemistry Matters Inc. and has several years of experience in academic, laboratory and industry settings. Prior to joining Chemistry Matters, Dr. Kates worked as an industrial post-doctoral research fellow through an NSERC research grant at Intrinsik Corp. At Intrinsik Corp., Dr. Kates' main focus was to research how human health risk assessments can be improved for the Alberta Oil Sands region.

Dr. Kates' experience includes a wide variety of specialties, such as the forensic interpretation of oil spills in Canada, the interpretation of fire debris for arson investigations and the investigation of clandestine drug operations. Dr. Kates has worked extensively on human health and ecological risk assessments, including risk assessments of traditional First Nations foods and science communication. Other projects include vapour intrusion modelling and the assessment of odours from industrial facilities and contaminated sites, as well as developing toxicity reference values for government authorities.

Dr. Kates is a specialist in the fingerprinting and source apportionment of petroleum products in the environment, as well as the fate and transport of organic and inorganic environmental contaminants. Dr. Kates has a strong background in organic, analytical and forensic chemistry, including chemical criminalistics, forensic drug analysis, clandestine drug operations and human toxicology. Specialty laboratory techniques Dr. Kates has trained and worked on include comprehensive two-dimensional gas chromatography and compound specific isotope analysis.

In addition to her passion for science, Dr. Kates is an avid rower and certified Rowing Canada Performance Coach.

### Education

**University of Strathclyde**, Glasgow, Scotland, 2013 – Doctorate of Philosophy in Environmental Forensics

**University of Strathclyde**, Glasgow, Scotland, 2008 – Master of Science in Forensic Chemistry

**University of Winnipeg**, Winnipeg, Canada, 2006 – Bachelor of Science in Biochemistry

### Career Summary

<b>2016-present</b>	Independent Consultant, Calgary, AB – Consultant Forensic Chemist
<b>2014-present</b>	Calgary Rowing Club, Calgary, AB – Recreational Rowing Program Head Coach
<b>2014-2016</b>	Intrinsik Corp., Calgary, AB – NSERC Post-doctoral research fellow/Environmental Scientist
<b>2013</b>	Manitoba Rowing Association, Winnipeg, MB – Assistant Provincial Coach
<b>2012</b>	Winnipeg Rowing Club, Winnipeg, MB – Club Coach
<b>2009-2011</b>	University of Strathclyde, Glasgow, Scotland – Teaching Assistant
<b>2008</b>	Institute of Environmental Science and Research, Auckland, New Zealand – Researcher
<b>2007</b>	Natural Resources DNA and Wildlife Profiling Centre, Peterborough, ON – Researcher

## Selected Project Experiences

### ENVIRONMENTAL/FORENSIC INVESTIGATIONS

#### **Suspected Clandestine Drug Laboratory**

*Dimensions Tech Services Inc., Yukon, Canada*

*2016 ongoing*

Provided guidance on sampling design and analytical methods for laboratory analysis of samples from the site of a suspected clandestine drug lab. Coordinated sampling between the laboratory and field team. Provided interpretation and analysis of results and recommendations for future work.

#### **Arson Forensic Investigations**

*AESRD and OFC for Government of Alberta*

*2016 ongoing*

Data interpretation and analysis for arson investigations for Alberta Environment and Sustainable Resource Development and the Office of the Fire Commissioner for Government of Alberta. Coordinated laboratory analysis of samples and standards using comprehensive two-dimensional gas chromatography and mass spectrometry.

#### **Scientific Support of Emergency Spill**

*Husky Energy, Alberta*

*2016 ongoing*

Provided scientific support and data analysis for the Husky Energy heavy oil release. Coordinated the interpretation of laboratory results and supporting scientific literature.

#### **Source Allocation of Environmental Contaminants in Gowanus Canal Superfund Site**

*Hess Corporation, USA*

*2016 ongoing*

Provided scientific support and data analysis relating to the production of expert reports for forensic PAH source allocation.

#### **Environmental Data Interpretation**

*Plains Midstream Canada, Alberta*

*2016 ongoing*

Provided modeling support for the fate, behaviour and fingerprinting of hydrocarbon vapours in order to determine source of an underground plume.

#### **Development of Sampling Plan**

*NuVista Energy, Alberta, Canada*

*2015*

Used existing data and data gaps to assist with the development of a sampling plan for a contaminated site following the accidental release of bitumen.

### HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENTS

#### **Screening of Hydraulic Fracturing Fluids**

*Confidential*

*2014-2016*

Provided QA/QC support to screen the constituents of hydraulic fracturing fluids against human health and ecological endpoints.

#### **Assessment of Vapour Intrusion at a Contaminated Site**

**City of Regina / Clifton Associates, Saskatchewan, Canada**

2016

Assisted with vapour intrusion modelling for the expansion of a transit operations center that is known to be located on a contaminated site. Assessment of potential human and ecological health impacts associated with petroleum hydrocarbon impacts in soil, groundwater and soil vapour according to provincial guidelines.

**Risk Assessment for an Oil Sands Mine Facility**

*Teck Resources Inc., Alberta, Canada*

2015

Assisted with the data analysis, computer modeling and statistical analysis of air quality data in support of an application for an oil sands mine facility. Chemicals of potential concern were identified and compared against regulatory guidelines. Extensive literature search was conducted to provide support when replying to questions from interveners.

**Vapour Intrusion Model in a Residential Neighbourhood**

*Sears Canada / Clifton Associates, Alberta, Canada*

2014

Provided data analysis and technical assistance for the assessment of potential human health impacts associated with petroleum hydrocarbon impacts in soil, groundwater, soil vapour and indoor air in a residential neighbourhood in Calgary, Alberta.

**Odour-related Impacts on a Residential Neighbourhood**

*Multi-Chem Canada / Bennett Jones LLP, Alberta, Canada*

2014

Provided technical assistance for the assessment of the potential health- and odour-related impacts associated with emissions from a proposed chemical storage and blending facility in central Alberta. Air quality data and modeling were used to determine the concentrations and locations of odorous chemicals, which were then compared against regulatory guidelines.

**Risk Assessment for a Pipeline Application**

*CH2M Hill / Kinder Morgan, Alberta, Canada*

2014

Provided technical support and data analysis in support of the application for the TransMountain Pipeline Expansion Project. Large datasets of air quality modeling were organized and analyzed using a variety of basic statistics.

**Literature Search and Database Creation**

*Clean Air Strategic Alliance, Alberta, Canada*

2014

Developed a search strategy and conducted a literature search of scientific abstracts from grey and peer-reviewed literatures on the ecological effects of chemicals associated with electrical generation. Relevant abstracts were classified and categorized into a bespoke database.

**Health Assessment of Oil and Gas Activity**

*Government of British Columbia, Ministry of Health*

2014

Provided technical support for the health assessment of oil and gas activity in northeast British Columbia. A comprehensive study was conducted in order to assess the current and future impacts of oil and gas activity, along with providing future recommendations.

## DEVELOPMENT OF HUMAN HEALTH AND ECOLOGICAL GUIDELINES

### Development of Site-Specific Groundwater Guidelines

*Matrix Solutions Inc., Alberta, Canada*

2016

Using guidance from Alberta Environment and Parks, assisted with modeling to develop a site-specific groundwater guideline for the protection of vapour intrusion from dimethyl disulphide at a contaminated industrial site.

### Development of Soil Screening Values

*Health Canada*

2016

Participated in the development of Canadian human health soil screening values for three substances: Sulphur Mustard, Thiodiglycol and Lewisite.

### Development of Short Term Toxicity Reference Values

*Health Canada*

2015

Followed a recently developed Health Canada method to assist in the derivation of short term and interim toxicity reference values for nickel, trichloroethylene and tetrachloroethylene. Feedback was provided regarding the performance of the prototype method.

### Development of Soil Quality Guidelines for Polychlorinated Biphenyls

*Confidential*

2014

Technical support for the development of interim soil and sediment quality guidelines for PCBs and a review of wildlife tissue quality guidelines.

## TRADITIONAL FOOD STUDIES

### Assessment of Chlorinated Organics in Moose Tissues

*Swan River First Nation, Alberta, Canada*

2016

Data interpretation and reporting of moose tissue quality and completion of human health risk assessment. Study was conducted in conjunction with community members and hunters in order to address the safety of moose tissue collected near an industrial waste facility.

### Country Foods Workshop

*Health Canada*

2016

Assisted with the development of a workshop on traditional (country) foods for Health Canada Employees

### Assessment of Moose Tissue Quality

*Chipewyan Prairie Dene First Nation, Alberta, Canada*

2014

Data interpretation and reporting of metals in moose tissue and completion of human health risk assessment. Study was designed to address concerns over moose tissue quality due to potential influence from nearby oil sands operations.

## Publications

### Peer Reviewed Publications: 4

- *Assessment of Exposure to Chlorinated Organics through the Ingestion of Moose Meat for a Canadian First Nation Community*, McAuley, C; Dersch, A; Kates, LN; Sowan, DR; Koppe, B and Ollson, CA, *Frontiers in Environmental Science*, 2016, 4:78, Doi: 10.3389/fenvs.2016.00078
- *Improving Risk Assessment Calculations for Traditional Foods Through Collaborative Research with First Nations Communities*, McAuley, C; Dersch, A; Kates, LN; Sowan, DR and Ollson, CA, *Risk Analysis*, 2016, DOI: 10.1111/risa.12578
- *Acute and chronic environmental effects of clandestine methamphetamine waste*, Kates, LN; Knapp, CW and Keenan, HE; *Science of the Total Environment*, 2014, 493, 781–788.
- *Prediction of the environmental fate of methylamphetamine waste*, Kates, LN; Gauchotte-Lindsay, C; Nic Daéid, N; Kalin, RM; Knapp, C and Keenan HE, In: Morrison, R. and O'Sullivan, G. eds. *Environmental Forensics: Proceedings of the 2011 INEF Annual Conference*, 2012, Royal Society of Chemistry Press.

### Theses: 2

MSc, 2008, University of Strathclyde. Title: *Iodine-containing liquids as a source of iodine in methamphetamine manufacture*

PhD, 2013, University of Strathclyde, Title: *Chemical profiling and environmental modelling of waste from clandestine methylamphetamine laboratories*