

# MARIANNE VANDERGRIENDT

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## PROFILE

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- An Environmental Research Technician experienced in the design, assembly, operation and analytical analysis of laboratory and field research projects related to contaminated groundwater, wastewater, soil, and air.
- Have successfully supported laboratory and field research and teaching activities of faculty, graduate and undergraduate students, and external clientele.
- Manage all aspects of the laboratory and provide specialized technical resource information for all researchers.
- Responsible for financial management of all research and laboratory accounts.

## SKILLS SUMMARY

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- Proven ability to carry out all technical and design aspects of environmental research projects, both independently and in a team environment, under time critical conditions.
- Have extensive knowledge of laboratory and field techniques and protocols for organic, inorganic and microbiological analysis of water, soil and air samples.
- Strong leadership skills, mentoring and technical writing skills.
- Fluent communicator with the ability to present course/laboratory and instrument presentations/demonstrations.
- Proficient in the use of current computer software and data acquisition software (Varian Star, Peak Simple, Agilent Chemstation).
- 29 years experience carrying out analytical and microbial analysis of soil, water and air samples.
- Experienced in the use of analytical instruments such as GC (FID, TCD, PID, ECD), GC-MS, HPLC, IC, AA.
- Contaminants analyzed include: petroleum hydrocarbons, chlorinated compounds, pesticides, alcohols, ethers, fatty acids, inorganics, hydrocarbon gases, standard gases.
- Proven ability in the set up, calibration and validation, of new and existing analytical methods.
- Experienced in analytical equipment maintenance, troubleshooting and reconfiguration.
- Proven capabilities in the design, implementation and monitoring of biodegradation studies (both aerobic and anaerobic), soil column experiments, isotherm experiments, immunological assays, biotechnological assays, isotopic studies, BOD assays.
- Microbiological skills include aseptic technique, microbial enumeration (aerobic/anaerobic plate counts, direct microscope counts, MPN estimates) and sterilization procedures (autoclaving, chemical sterilization, membrane filtration).
- Working knowledge of field sampling techniques (bailers, Waterra Pump, snap samplers, peristaltic pumping, soil coring techniques).
- Proficient in the use of dissolved oxygen, pH, specific ion, and conductivity probes and Hack spectrophotometer and Chemetrics diagnostic kits.
- Experienced in the selection, costing and purchase of both laboratory and field equipment.

- In depth knowledge of financial procurement and administration of research accounts (preparation of financial statements, preparation and tracking of invoices, adherence to financial requirements/guidelines specified by sponsors, and to University policies pertaining to research, ability to handle confidential information with discretion)
- Proven track record with the implementation and maintenance of safety and waste disposal procedures for both the laboratory and field.

## EMPLOYMENT HISTORY

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1981-Present Earth and Environmental Science, University of Waterloo Waterloo, On  
***Environmental Research Technician USG-8***

- Working with researchers to design, develop, evaluate, and perform experimental procedures and analytical techniques as required for the implementation of research projects related to contaminated groundwater and biodegradation processes. Must ensure feasibility of experimental design and validity of results under time critical conditions. Work is conducted under the limited direction of faculty members.
- Ensure that the laboratory maintains and improves its functionality with regard to both internal and external client needs. Oversee the day-to-day operations of the laboratory. Duties include maintaining adequate supplies of all consumables and chemicals, and performing regular maintenance on analytical equipment (auto samplers, injection ports, detectors, data acquisition systems, column installations, gas supplies etc.).
- Review, select and utilize current scientific publications and/or technical literature to develop new and or innovative analytical procedures and research experiments.
- Perform sample analysis utilizing analytical equipment such as GC (FID, TCD, ECD, PID), GC-MS and IC/HPLC. Usage of sample delivery techniques include: solvent macro and micro-extractions, headspace analysis, direct aqueous injections, SPME, gaseous and liquid sample delivery via automated gas sampling loops, and purge and trap. Required to maintain, calibrate, install, trouble-shoot, assemble, design, test and/or modify analytical equipment.
- Perform laboratory techniques following published analytical test method protocols (i.e. EPA, ASTM, MOE).
- Support field sampling activities of researchers at field research sites and maintain field sampling equipment (peristaltic pumps, multi-level well sampling devices, vacuum manifolds, Waterra pumps, Bailers, Snap samplers, support soil coring procedures). Provide field technical advice to the research population to help achieve their research objectives.
- Present oral laboratory demonstrations for graduate courses (Environmental biogeochemistry 624, Organic Contaminants in the Subsurface 657, Field Methods in Hydrology 671. Provide instruction with regard to experimental design, methodology, analytical methods, equipment operation, and relevant theoretical background.
- Responsible for the implementation, maintenance and training of QA/QC programs for all analysis and experiments performed. Complete internal and external standard calibration curves (linear, quadratic, semi-log regressions), precision and accuracy determinations (%Error and %RSD), MDL determinations (EPA), required blanks, matrix spikes and surrogates.
- Required to prepare reports for both internal and external clients, including appropriate computations, statistics, spreadsheets, graphics and data interpretation. Provide written experimental and analytical methodologies. Utilize the necessary computer software (Excel,

Access, Word, Instrument software, HTML).

- Ensure that all laboratory and field users conform to University of Waterloo safety standards and carry out experimentation in a safe manner. Review, interpret and implement new safety procedures within the laboratory and at field sites. Ensure all equipment meets safety requirements. Supervise the waste management procedures for the disposal of hazardous chemical wastes generated in the laboratory and at field sites.
- Provide input/review in the selection of major equipment purchases. Required to evaluate, identify, select and purchase equipment and instrumentation that satisfies present and future research needs. This includes obtaining/providing up to date quotes and written proposals. Equipment purchased includes GC-MS, GC's, auto samplers, integrators, chromatography analysis software with computers, analytical columns, anaerobic chambers, probes, pumps, divers etc.
- Perform aseptic technique, microbial enumeration, immunological assays, biodegradation studies, BOD analysis and biotechnical procedures.
- Supervise, train and allocate work to junior technicians, graduate/undergraduate/co-op students, in their performance of analytical, experimental and microbiological procedures. Hire casual employees.
- Provide primary client contact service for the laboratory. Provide information about available experimental, analytical and microbiological services to both internal (faculty members, visiting scientists, graduate and undergraduate students) and external (general public) customers. This involves consultation, costing and providing appropriate literature. Prepare laboratory promotional materials (web page, brochure etc.). Liaison with other laboratory analysts to determine procedures, work schedules and provide quality data and customer support and satisfaction.
- Responsible for invoicing internal and external clients for all work performed by the laboratory. Maintain and upgrade invoicing data base (Microsoft Access).
- Manage laboratory and research financial accounts (>20 accounts, NSERC, OCE, CWN, Industrial partners) by utilizing university financial software (FORE). Keep current records of invoices, payments, purchases, salaries etc. in accordance with University financial procedures. Establish pricing policies for the services provided by the laboratory. The incumbent has signing authority for the laboratory and research accounts (>\$500,000 per year).

**WORK EXAMPLES:**

- Purchased and implemented a data acquisition system to electronically collect data from all older existing equipment (>7 GC's), using Peak simple software.
- Recently (2010) presented power point presentations (Laboratory Analysis of Organics in Groundwater) for both Field Methods in Hydrogeology, course code 671 and Organic Contaminants in the Subsurface, course code 657.
- Selected and purchased, with CFI funds, a new Agilent 7890 GC FID with autosampler capability (equipment cost >\$45,000).
- Over a 6 month period, designed a sampling and analytical technique to collect and monitor hexane/pentane vapour samples in support of a project/student studying the effects of LNAPL recovery during an engineered field spill. Sample collection was performed underwater from an extraction line in the field, and samples were shipped to the laboratory for analysis. Initially, tests were performed to evaluate sample collection reproducibility, sample storage time, and analytical method validity. Gaseous field samples were loaded onto the GC FID column with a gas sample loop. The gas sample loop was externally plumbed into a split injection port with a supelco wax capillary column. Analysis run time was only 2 minutes, which allowed processing of a high

volume of samples. An analytical method to extract and quantify hexane and pentane, from activated charcoal, utilizing carbon disulfide as an extraction solvent, was also established to support the project.

- Technically designed and set up continuous soil columns used to study the effect of high ethanol concentrations on the biodegradation of dissolved gasoline components. The design utilized Teflon, glass, and stainless gas tight parts, to prevent volatilization, sorption and leaking of volatile gasoline components. The complex design involved the addition of groundwater, nutrients and contaminants in line, before the column inlet under aseptic conditions. Measurements of contaminants, microbial populations and dissolved oxygen were monitored over time.
- Modified an existing extraction method to recover gasoline contaminants adsorbed onto Optipore sorbent used in field dosimeters. The dosimeters were implanted in the field for periods of time and then evaluated for contaminant loading.
- Assisted a visiting scientist to design and set up a series of anaerobic ethanol-gasoline biodegradation experiments, in order to complete and submit a research paper within a 1 year time period.
- Provided analytical and field support for a major surface gasoline/MTBE/Ethanol spill. Weekly monitoring included BTEX, TMB, Naphthalene, MTBE, Ethanol, O<sub>2</sub>, CO<sub>2</sub>, vapour BTEX. Hundreds of samples were processed weekly.
- Designed and implemented Kd Isotherm experiments for an external Mexican consulting firm (\$20,000)
- Currently working on experiments to study the role of temperature in the remediation of petroleum contaminants by oxidation (persulfate, percarbonate) in saline environments.

1981(May)–1981(June)Labstat

Kitchener, On

***Laboratory Technician***

- Veterinary diagnostic analysis (BUN, Creatine).
- Research project support (analysis of cotinine in blood).

**EDUCATION**

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1976–1980 University of Waterloo

Waterloo, On

- Honours Bachelor of Science, Biology (major Microbiology).

**INTERESTS**

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Member of iRunUW Committee, Member of Social Justice Group (University of St. Jerome's), Fitness, Stone Landscaping, Gardening, Decorating, Reading.

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