


**One Day Course Brought to You by
Canadian Prairies and Northern Section (CPANS)
of the Air & Waste Management Association (A&WMA):**

INTRODUCTION TO AIR QUALITY DISPERSION MODELLING

Date:	March 14, 2023
Time:	8:00 am
Cost:	\$450 – A&WMA Member \$500 – Non-Member
Location:	Aurora Room, University of Alberta, Edmonton, AB T6G 2H6



Registration: cpans.org/event/dispersionmodellercourseedmonton2023/

Intended Audience

This one-day introductory course is designed for permitting staff, regulators, consultants, engineers, and managers with ambient air quality management responsibilities. The course will consist of technical lectures with relevant examples. Topics include air quality issues, fundamentals of meteorology, air quality model types and selection, and emission estimates. There will be no hands-on training.

At the end of the course, attendees will:

- have a better understanding of the key meteorological processes that impact air quality,
- be able to select the appropriate model(s) to address specific air quality issues; and
- be able to assess necessary input data and critically review air quality modelling studies.

Instructors

Dr. Mujtaba Shareef is a versatile and experienced environmental professional with strong analytical and innovative capability with a demonstrated record of excellence in service delivery. He has over 24 years of solid experience encompassing technical expertise in the areas environmental performance, management, monitoring, regulatory compliance, environmental policy development. He has significant experience in air emissions and GHG accounting and inventory management, air quality and climate change, environmental and social impact assessment (ESIA), environmental modeling for ESIA's, environmental policies and guidelines and related research and development. He is well versed with several air quality models including AERMOD, CALPUFF and CMAQ and have done training courses on these models. Dr. Shareef possesses exceptional skills in teaching and mentoring and has taught several graduate and undergraduate courses and other short courses. He has organized many workshops and awareness sessions.

Dr Piotr Staniaszek has more than 27 years of experience in air quality consulting including more than 24 years as an air dispersion modeller. He has managed and executed numerous dispersion modeling projects throughout whole Canada including Alberta, BC, Saskatchewan, and Manitoba. He has done modelling for two potash mining projects in Saskatchewan. He has organized and co-instructed several CALPUFF/CALMET

introductory and advanced courses. Dr. Staniaszek was also co-instructor in a two-day training course entitled *Guidance on Review of Air Quality Environmental Assessment Reports* and one day *Introductory Dispersion Modelling Course* in Alberta. Dr. Staniaszek has been a Sessional Instructor at the University of Calgary for many years. Dr. Staniaszek has experience developing emissions inventories, models and preparation of Environmental Impact Assessments (EIAs) for the oil sands, sand, gravel quarries, coal, potash, gold, diamond, and mineral mines, and petrochemical industries. He has written numerous air quality management plans including flaring and dust management plans. Presently, Dr. Staniaszek is Senior Air Quality Scientist, Global Air Quality Modelling Specialty Lead for AECOM, Canadas Ltd.

Course Outline

Check-in: 8:00 am – 8:30 am

Morning 1: Air Quality Issues Overview (8:30 am – 10:15 am)

- Air Quality Issues
- Near-field vs. Short and Long Range Models
- Screening vs. Refined Models
- Complex Modelling for EIA's
- Emission Sources: point, area, volume, line sources, and flares
- Variable Emission Sources
- Roads and Modelling of Explosions Emission

Morning Coffee Break Q/A: 10:15 am – 10:30 am

Morning 2: Meteorology (10:30 am – 12:00 pm)

- Boundary Layers Fundamentals
- Meteorological Input to Air Quality Models
- Prognostic (MM5 / WRF) vs. Diagnostic (CALMET)
- Observations and Meteorological Processors (AERMET, MMIF)
- Meteorological Model Evaluation and Influence of Meteorology on Dispersion Model Results

Lunch Break: 12:00 pm – 1:00 pm (Lunch will be provided)

Afternoon 1: Air Dispersion Modelling in More Detail (1:00 pm – 2:30 pm)

- Lagrangian Puff (CALPUFF) vs. Gaussian Plume (AERMOD) Models
- Lagrangian (CALPUFF) vs. Eulerian (CMAQ) models
- Interpreting Modelling Results
- Dispersion Model Performance Validation and Evaluation
- Sources of Model Inaccuracy

Afternoon Coffee Break: 2:30 pm – 2:45 pm

Afternoon 2: Specialty Modelling (2:45 pm – 4:15 pm)

- Fog and Visibility
- Odour Modelling
- NO₂ Modelling
- Flare Modelling (AERFlare, ABFlare)
- Modelling of Haul Roads and Mining Emissions

Questions & Answers: 4:15 pm – 4:30 pm