



**Exponent<sup>®</sup>**  
Engineering & Scientific Consulting

## Mick Bodnar, P.Eng.

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Canada

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## Professional Profile

Mr. Bodnar has over 25 years of engineering experience in a range of technical and leadership roles. Since 2005, he has specialized in applying the principles of engineering and fire science to the practice of fire protection engineering and the investigation and engineering analysis of fires, explosions, and other failure incidents.

Mr. Bodnar is experienced in all manner of fire and explosion investigations in the industrial, commercial, residential, vehicle and equipment, and wildland environments, including multiple large loss investigations (\$100 million+). He has been qualified as an expert witness in the Court of King's Bench of Alberta and the Court of King's Bench of Saskatchewan.

Mr. Bodnar is recognized for his strong technical ability and science-supported opinions. He delivers clear explanations and communicates complex matters in an easy-to-understand manner, allowing his clients to make the most informed decision possible. Mr. Bodnar has supplemented his practical, technical and educational background by volunteering in the codes and standards development process, provincially and nationally in Canada and with the National Fire Protection Association.

In addition, Mr. Bodnar has extensive experience in building design and construction, including building and fire code consulting, plan review, fire protection system design, fire and life safety inspections and assessments, hazard identification and risk analysis, and the development of alternative solutions / variances, including performance-based design. He has extensive fire, smoke, and explosion modeling experience, including from first principles and utilizing zone modeling and computational fluid dynamics (CFD).

## Academic Credentials & Professional Honors

M.Eng., Engineering, University of Maryland, College Park, 2008

B.Eng., Chemical and Materials Engineering, Royal Military College of Canada, 1996

Member, The Honor Society of Phi Kappa Phi

### Committee Memberships

Former Principal Member - Technical Committee on Wildland-Urban Interface, National Research Council of Canada (2018 – 2021)

Former Principal Member - Standing Committee on Fire Protection, National Research Council of Canada (2013 – 2020)

Former Principal Member - Technical Committee, NFPA 1730: Standard on Organization and Deployment of Fire Prevention, Inspection, and Code Enforcement, Plan Review, Fire Investigation, and Public Education Operation (2011 – 2019)

Former Principal Member - Technical Committee, NFPA 1452: Guide for Training Fire Service Personnel to Conduct Community Risk Reduction (2014 – 2019)

Former Principal Member - Technical Committee, NFPA 1300: Standard on Community Risk Assessment and Community Risk Reduction Plan Development (2014 – 2019)

Former Principal Member - Fire Technical Council, Safety Codes Council of Alberta (2010 – 2014)

Former Member - Practice Standards Committee, Association of Professional Engineers and Geoscientists of Alberta (2010 – 2014)

## Licenses and Certifications

Certified Fire and Explosion Investigator (CFEI)

Certified Fire Investigation Instructor

Certified Fire Investigator (CFI)

## Prior Experience

Principal and Head of Forensic Technical Services (Canada), HKA (Global) Inc., 2021 – 2022

Vice-President, Forensics (Western Canada), EFI Global, 2020 – 2021

Founder and Managing Principal, Buffalo Fire Engineering Ltd., 2018 – 2020

Director and Vice-President, Jensen Hughes, 2015 – 2018

Principal, Sereca Fire Consulting Ltd. (acquired by Jensen Hughes in 2015), 2009 – 2015

Senior Fire Protection Engineer, BC Hydro, 2008 – 2009

Senior Forensic Fire Engineer, Sereca Fire Consulting Ltd., 2005 – 2009

Field Engineer, Precision Energy Services, 2001 – 2005

Officer, Canadian Armed Forces (Army), 1992 - 2001

## Professional Affiliations

Canadian Association of Fire Investigators (Member)

International Association of Arson Investigators (Member)

National Association of Fire Investigators (Member)

National Fire Protection Association (Member)

Society of Fire Protection Engineers (Member)

## Publications

### **Presentations**

“Building Code Seminar: Alternative Solutions and the Objective-Based Code”, Saskatchewan Association of Architects, Regina and Saskatoon, Saskatchewan, Canada, March 2015

“Building Code Seminar: Alternative Solutions and the Objective-Based Code”, Alberta Association of Architects, Calgary and Edmonton, Alberta, Canada, February 2015

“Fire Protection Engineering for Industrial Applications”, The Chelonian Group, Calgary, Alberta, Canada, April 2014

“Changes to the 2010 National Building Code: Preparing for the Next Code”, BUILDDEX Edmonton, Alberta, Canada, March 2013

“The Evolution of the Building Code: Providing Historical Context to Today’s Code”, BUILDDEX Edmonton, Alberta, Canada, March 2012

“Fire Investigation in the Industrial Environment”, Alberta Industrial Fire Protection Association, Canada, March 2012

“Building Code Seminar: Mezzanines, Interconnected Floor Spaces, and Spatial Separation”, Alberta Association of Architects, Calgary and Edmonton, Alberta, Canada, February 2012

“Applying Codes and Standards to Industrial Occupancies: Fire and Life Safety Compliance”, Alberta Industrial Fire Protection Association, Red Deer, Alberta, Canada, September 2011

“Detection, Suppression, and Mitigation of Transformer Fires and Explosions”, BC Hydro, May 2009

“Reverse Engineering – Applying Fire Science to the Analysis of Real Fires”, CICMA, Winnipeg, Manitoba, Canada, April 11, 2008

“Fire and Explosion Safety at Underground Power Plant Facilities”, BC Hydro, December 2008

“Building Services and Fire Scene Investigation”, Justice Institute of British Columbia, Canada, December 2007

## Project Experience

### **Buildings**

#### **Forensic and Expert Witness**

Fire Investigation, Calgary, Alberta (2010 – 2021)

Conducted primary investigation of the origin and cause of a residential fire that destroyed a large low-rise condominium building and damaged several other buildings. Investigation identified multiple building code deficiencies facilitating fire spread. Quantified impact of deficiencies on the value of the loss. Provided expert advisory support through the litigation process. Value of loss estimated at \$40,000,000.

Wildland Fire Investigation, Claresholm, Alberta (2021)

Retained to conduct origin and cause fire investigation of a wildland fire that destroyed several homes.

#### Fire Investigation, Northwest Territories (2021)

Retained by insurer of the territorial government housing corporation to investigate origin and cause of a fatal structure fire that destroyed a large apartment complex.

#### Fire Investigation, Edmonton, Alberta (2013 – 2018)

Provided expert advisory services resulting from claims associated with the largest fire loss in the City of Edmonton's history, estimated at \$20,000,000 to \$30,000,000. Fire destroyed a low-rise condominium building under construction and destroyed or damaged dozens of surrounding homes. Work included a review of compliance with requirements for protection of adjacent buildings during construction and the quantification of radiant heat impact on nearby structures.

#### Wildland Fire Investigation, Fort McMurray, Alberta (2016)

Retained by a consortium of insurers to investigate the origin and cause of a wildland fire that destroyed large areas of Fort McMurray, Alberta. The fire resulted in the largest insured loss in the history of Canada, estimated at \$10 billion.

#### Fire Investigation, Banff, Alberta (2016)

Conducted the origin and cause investigation of a large fire that destroyed a 108-year-old historic hotel. Loss estimated at \$50,000,000.

#### Fire Investigation, Lloydminster, Alberta (2012 – 2016)

Provided expert litigation support and expert witness testimony with respect to a large fire that destroyed a 20,000 ft<sup>2</sup> recreational vehicle dealership. Work included fire testing and the application of fire modelling to support fire origin hypothesis.

#### Fire Investigation, Fort McMurray, Alberta (2012 – 2021)

Provided expert advisory and expert witness testimony for a large fire that destroyed a low-rise apartment complex. Issues addressed included several building code violations, including façade construction and material specifications.

#### Wildland Fire Investigation, Slave Lake, Alberta (2011)

Retained by a consortium of insurers to investigate the origin and cause of wildland fire that destroyed large areas of Slave Lake, Alberta. Damages estimated at \$700,000,000.

#### Explosion Investigation, Edmonton, Alberta (2010)

Conducted investigation of the origin and cause of a residential explosion that destroyed three homes, severely damaged 40 others, and resulted in three fatalities.

### **Design**

#### New Horizon Mall, Balzac, Alberta (2013 – 2020)

Provided building and fire code consulting and fire engineering services for a 300,000 ft<sup>2</sup> retail mall. Work included several performance-based alternative solutions utilizing computer fire modelling.

#### ICE District, Edmonton, Alberta (2013 – 2018)

Provided building and fire code consulting services for the ICE District, a multi-building mixed-use development covering 25 acres around the Rogers Centre in downtown Edmonton, Alberta. Work included several performance-based alternative solutions.

Brookfield Place, Calgary, Alberta (2013 – 2018)

Provided building and fire code consulting and fire engineering services for 56 storey, 1.4 million square foot office development. Performance-based alternative solutions, utilizing computer fire modelling, were developed to address specific issues related to the unique uninterrupted façade design, as well as travel distance issues in the large underground parkade.

National Music Centre, Calgary, Alberta (2012 – 2016)

Provided building and fire code consulting and fire engineering services for the 160,000 ft<sup>2</sup> National Music Centre. Work included several performance-based alternative solutions utilizing computer fire modelling to maintain the architect's original design intent.

## **Oil and Gas**

### **Forensic and Expert Advisory**

Fire Investigation, Odessa, Texas (2021)

Retained to conduct the root-cause investigation of an oilfield fire involving hydraulic fracturing equipment.

Fire Investigation, Fort McMurray, Alberta (2021)

Retained to investigate the origin and cause of a fire at an open-pit oilsands mine near Fort McMurray, Alberta. Investigation identified maintenance and repair issues with the associated equipment.

Explosion Investigation, Fort McMurray, Alberta (2011)

Retained to identify the root cause and contributing factors of an explosion at an oilsands producer near Fort McMurray, Alberta that injured several people. Scope of work included assisting with the identification of design and process changes to reduce the likelihood of a repeat event.

Fire Investigation, Fort McMurray, Alberta (2010)

Completed investigation of origin and cause of a large fire at an oilsands producer north of Fort McMurray, Alberta. Scope of work included a fire spread and fire damage assessment. Value of loss estimated at \$500,000,000.

## **Design**

CNRL Kirby North SAGD, Fort McMurray, Alberta (2013 – 2014)

Provided building and fire code and fire engineering consulting services for a steam-assisted gravity drainage processing facility. Scope of work included risk-based alternative solutions and risk-specific fire protection design.

Hangingstone SAGD, Fort McMurray, Alberta (2014)

Provided building and fire code and fire engineering consulting services for a steam-assisted gravity drainage processing facility. Scope of work included the development of several alternative solutions to address project specific requirements and to achieve acceptance by the Authority Having Jurisdiction.

## **Mining and Minerals**

### **Forensic and Expert Advisory**

Fire Investigation, Dease Lake, British Columbia (2021 – Present)

Retained to investigate the cause of a mining equipment fire. Investigation identified a defect in the wiring design contributing to the cause of the fire. Currently providing expert advisory support in litigation involving the equipment manufacturer.

Fire Investigation, Chetwynd, British Columbia (2021 - Present)

Retained to investigate the origin and cause of a fire involving open-pit mining equipment. Investigation identified a deficiency in the OEM design. Currently providing expert advisory support in litigation involving the equipment manufacturer.

Explosion Investigation, Sparwood, British Columbia (2018)

Retained to investigate the cause of an explosion at a coal mining facility near Sparwood, British Columbia. Explosion was related to a fluidized-bed thermal coal dryer. Investigation identified several issues, including with the programming of the dryer controls and the design of the building's explosion venting.

## **Power and Utilities**

### **Forensic and Expert Advisory**

Explosion Investigation, Prince Albert, Saskatchewan (2019 – 2020)

Investigated the cause of an arc flash event at a power generating station that occurred during testing and commissioning. Investigation identified both design issues and issues related to the testing and commissioning procedures.

Fire Investigation, RM of Tecumseh, Saskatchewan (2020 – 2021)

Retained to investigate the origin and cause of a fire that destroyed a portable outdoor distribution station (PODS). Investigation identified issues related to the component specifications for the equipment, resulting in the failure and subsequent fire.

## **Industrial and Manufacturing**

### **Forensic and Expert Advisory**

Explosion Investigation, Brooks, Alberta (2021)

Retained to investigate the root cause of a dust explosion at a large industrial feedlot near Brooks, Alberta that resulted in injuries to three workers.

Fire Investigation, Prince George, British Columbia (2019 – Present)

Investigated the cause of a large fire at a bioenergy facility near Prince George, British Columbia. Several issues related to a contractor's compliance with the fire code were identified that resulted in the fire. Current involvement includes expert advisory services vis-à-vis applicable code requirements and standard of care.

#### Explosion Investigation, Viking, Alberta (2019)

Retained to investigate the cause of an explosion in a gravity fed grain dryer located near Viking, Alberta. Issues related to the absence of adequate fire detection and controls, the absence of adequate process filtration, and the overall design of the dryer (resulting in reduced airflow and increased static pressure) were identified.

#### Explosion Investigation, Calgary, Alberta (2018)

Retained for the origin and cause investigation related to an explosion that occurred at an industrial flour processing facility. Investigation identified deficiencies related to NFPA 61 as well as with the explosion protection design.

#### Explosion Investigation, Yorkton, Saskatchewan (2014)

Investigated the cause of a large dust explosion at a canola-crushing plant. Investigation identified issues related to the preventive maintenance procedures of plant equipment and the explosion protection design.

#### Explosion Investigation, Edmonton, Alberta (2011 – 2018)

Provided expert advisory support with regards to an industrial explosion that occurred at a polymer manufacturing facility. Several issues related to both the process design and process operating procedures were identified. In consideration of the unique circumstances and chemicals involved in the incident, questions related to the type of explosion (specifically with regards to a deflagration to detonation transition as opposed to a condensed phase explosion) were resolved.

#### Explosion Investigation, Prince George, Alberta (2008)

Conducted the investigation into the origin and cause of a fire that destroyed a 200,000 ft<sup>2</sup> plywood manufacturing facility. The investigation identified contributing factors related to building renovations, fire protection system design, and fire protection system maintenance.

## Additional Education & Training

2023 Fire Investigation Training Program - Dallas - Main Program

FI-210, Wildland Fire Investigation, Wyoming Fire Academy (2013)

Motive, Means, and Opportunity: Determining Responsibility in an Arson Case, International Association of Arson Investigators, CFI Trainer (2011)

Post-flashover Fires, International Association of Arson Investigators, CFI Trainer (2011)

Investigating Motor Vehicle Fires, International Association of Arson Investigators, CFI Trainer (2011)

Fire and Explosion Investigations: Utilizing NFPA 1033 and 921, International Association of Arson Investigators, CFI Trainer (2010) Critical Thinking Solves Cases, International Association of Arson Investigators, CFI Trainer (2011)

A Ventilation–Focused Approach to the Impact of Building Structures and Systems on Fire Development, International Association of Arson Investigators, CFI Trainer (2011)

Arc Mapping Basics, International Association of Arson Investigators, CFI Trainer (2011)

Effective Investigation and Testimony, International Association of Arson Investigators, CFI Trainer (2011)

Ethics and the Fire Investigator, International Association of Arson Investigators, CFI Trainer (2011)

Introduction to Evidence, International Association of Arson Investigators, CFI Trainer (2011)

Explosion Dynamics, Introduction to Fire Dynamics and Modeling, International Association of Arson Investigators, CFI Trainer (2011)

Investigating Fatal Fires, International Association of Arson Investigators, CFI Trainer (2011)

The Scientific Method for Fire and Explosion Investigation, International Association of Arson Investigators, CFI Trainer (2011)

Fundamentals of Residential Building Construction, International Association of Arson Investigators, CFI Trainer (2010)

Managing Complex Fire Scene Investigations, International Association of Arson Investigators, CFI Trainer (2010)

Advanced Fire Fighting training, Gulf Technical and Safety Training Centre, Abu Dhabi, United Arab Emirates (2002) and Canadian Forces Fire Academy, Borden, Ontario (1995)

Completed officer formation as a member of the Corps of Royal Canadian Electrical Mechanical Engineering Branch of the Canadian Army. Included technical, tactical, and practical lectures and exercises over 45 weeks, including advanced training in military ordnance and explosive ordnance disposal.

## Deposition & Trial Testimony

The Board of Trustees of Lanesborough Real Estate Investment Trust, et al v James Smith, et al, 2021 Court of Queen's Bench of Alberta 1403-01760.

Bowness Real Estate Corp. v Pacific Insurance Company, 2020 Court of Queen's Bench of Alberta 327.

Heiser's Health and Fitness Ltd. v Saskatchewan Government Insurance, 2019 Court of Queen's Bench of Saskatchewan 124

Border City RV Centre v Vanguard Inc., 2016 Court of Queen's Bench of Alberta 31