Bruce G. Bennett

Mr. Bennett is a Senior Consultant in Hydrogeology with over 28 years of experience in hydrogeology, environmental engineering and project management. He has been responsible for technical input for domestic and international projects on hydrogeological issues related to groundwater contamination and site remediation, water supply, dewatering and groundwater modeling/regional flow evaluation. Mr. Bennett is experienced in all phases of project execution, including project planning, provision of specialized technical inputs, liaison with clients and regulatory agencies, management of multidisciplinary study teams, data analysis, and report preparation and review.

Education

McMaster University, Hamilton, Ontario
- B.A. Geography and Geology, 1975

University of Alberta, Edmonton, Alberta
- M.Sc. Hydrogeology, 1989

Professional Associations

Association of Professional Geoscientists of Ontario—Member
International Association of Hydrogeologists—Member

Experience

Senior Consultant, Hydrogeology
Acres International—2003 to Present

1996–2003
Senior Consultant, Hydrogeology
Acres & Associated Environmental Limited, Toronto, Ontario

Contaminant Hydrogeology/Site Remediation
Project Manager/Coordinator for the following environmental projects
- design, construction supervision, operation and monitoring of two dual-phase product recovery systems and a potassium permanganate injection system, in connection with the remediation of groundwater impacted by petroleum hydrocarbons and trichloroethylene, respectively, at an industrial plant in New Brunswick
- environmental site assessment and screening of candidate “brownfield” properties to address issues associated with real or perceived subsurface contamination at these properties, for Town of Fort Erie Economic Development and Tourism Corporation
- geophysical (EM) investigation of 33 Niagara Catholic District School Board properties to assess whether underground storage tanks (USTs) formerly containing fuel oil may still be in place
- bench scale treatability study and preparation of leachate management plan for the removal of iron, zinc and ammonia from leachate at the Regional Municipality of Niagara’s Quarry Road landfill
- soils investigation of a 40-ha sized, former, industrial plant in the City of Niagara Falls (“brownfield” site) in connection with a proposed Institutional/Parkland/Commercial redevelopment of the property
- subsurface investigation, and preparation and implementation of an action plan for grout stabilization of soils that had subsided over a damaged,

2.1-m dia, abandoned sewer at an industrial plant located in Pt. St. Charles, Quebec
- assessment of wastewater treatment alternatives in connection with a proposal to combine two separate condiment plants into one plant located in southern Ontario
- preparation and implementation of a closure plan for the Regional Municipality of Niagara's Quarry Road landfill involving the evaluation of the final contours and cover design, leachate treatment alternatives, control of surface water drainage and the development of after-use and landscape plans
- on behalf of The Fiton Corporation, preparation and implementation of a remedial action plan for the in situ bioremediation of petroleum hydrocarbon contaminated sediments along the Pembroke Canal running through the Bermuda Electric Light Company's property
- soil and groundwater investigation, risk assessment and assessment of remediation alternatives for a commercial property in Toronto contaminated by trichloroethylene
- review of environmental issues associated with proposed landfill at a pulp and paper mill in New Brunswick, on behalf of the Eel Ground First Nation.
- investigation and preparation of remediation plans for petroleum hydrocarbon contaminated soils at two thermal generating plants in Tanzania for the Ministry of Energy and Minerals
- assessment of proposed remediation and demolition plans submitted by developers for the redevelopment of the former Naval Air Station Annex lands on behalf of the Government of Bermuda
- environmental investigation and remediation of 20 000 t of heavy metal and petroleum hydrocarbon contaminated fill at a glass plant in southern Ontario
- a proposed remediation plan involving the capping of four landfill sites containing cyanide waste materials, on behalf of the City of Niagara Falls and the Ministry of Environment and Energy
- contaminant hydrogeology and site remediation training to engineering staff at MACE in Bombay, India, as part of a CIDA technology transfer program.

Environmental Assessment

Project Manager/Coordinator for the following environmental assessment projects:

- review of Environmental Assessment (EA) documents prepared by Ontario Power Generation (OPG) in connection with OPG's submission to the Canadian Nuclear Safety Commission (CNSC) for approval of the proposed Pickering Waste Management Facility (WMF) II
- formulation of environmental assessment documents associated with navigable waters, water bodies and wetlands, terrestrial and aquatic ecology, surface water and groundwater issues as part of bi-national integrated EA for proposed Peace Bridge expansion project
- detailed environmental screening of six runway layout options against 14 environmental factors in connection with potential Pickering reliever airport on behalf of Greater Toronto Airports Authority

- update of the Union Gas environmental assessment document for the 18 km NPS 48 gas pipeline between the Hamilton valve site and Milton
- review of Environmental Assessment Guidelines prepared in connection with OPG's proposed Darlington Used Fuel Dry Storage Facility and Pickering WMF II
- on behalf of a prospective power producer, review of environmental documents in connection with OPG's divestment of Mississagi River hydroelectric generating facilities
- review of draft EA documents prepared by OPG in connection with OPG's submission to the CNSC for approval to return the Pickering 'A' reactors back into operation
- review of draft terms of reference submitted by Clarington Waste Processing Centre Ltd. in connection with the proposed expansion of an existing landfill, on behalf of the Municipality of Clarington.

Water Supply/Groundwater Modeling

Carried out the following groundwater investigations and hydrogeologic assessments in connection with water supply, dewatering and various engineering projects

- on behalf of the U.S. Army, evaluation of two production wells at Bagram Airfield, Afghanistan, to determine if wells could provide a combined supply of 1900 m^3/day
- evaluation of flow available from 20-Mile Creek for irrigation water supply purposes at Scenic Woods Golf & Country Club
- hydrogeological inspection of groundwater supply system at Burritt's Rapids Correctional Facility as part of the requirement for an Engineer's Report under Ontario Reg. 459/00
- prepared a Phase 1 & II Class EA report in connection with a proposed residential, retirement complex at the Scenic Woods Golf & Country Club, including the investigation and assessment of groundwater conditions, the development of a 250 m^3/day water well supply, water treatment by reverse osmosis and sewage treatment using a sequencing batch reactor.

1994–1995
Consultant, Hydogeology
Acres International

Project Manager/Coordinator for the following waste management projects

- assessment of disposal/treatment alternatives for the proposed dredging of sediments from the Miramichi River for the Canadian Coast Guard
- Phase III environmental issues inventory at the Big Trout Lake First Nation
- hydrogeologic investigation of creosote and PCP contamination at a wood preservative plant in Newfoundland
- hydrogeologic investigation and preparation of a remedial action plan for in situ remediation of soils and groundwater contaminated by petroleum hydrocarbons at an industrial plant in New Brunswick
- technical documents submitted by Laidlaw Waste Systems (Durham) in connection with a proposed infill expansion of the Newcastle landfill, on behalf of the Town of Clarington

- a proposed groundwater remediation scheme involving the removal of Bunker 'C' oil from a karstic limestone aquifer in The Pas, Manitoba, on behalf of Manitoba Environment.

1993–1994
Senior Hydrogeologist
Gartner Lee Inc., Niagara Falls, New York
Project Manager for the following waste management projects

- hydrogeologic investigation of a former coal gasification plant and an on-site treatment area used to treat cyanide process wastes at an industrial plant in Niagara Falls, Ontario
- investigation of the volatility and leachability of naturally occurring BTEX from shale formations in connection with the Niagara River hydroelectric development project proposed by Ontario Hydro
- evaluated potential groundwater/soil contamination concerns at a site proposed for industrial development adjacent to the Smithville PCB waste management facility.

1986–1993
Senior Hydrogeologist
Acres International
Project Manager/Coordinator for the following waste management projects

- development of a remediation plan for the cleanup of 50 000 m^3 of soil and 140 000 m^3 of harbor sediments contaminated by creosote at the Northern Wood Preservers facility in Thunder Bay, Ontario
- hydrogeologic investigation and preparation of closure plan for two landfills at the Repap pulp and paper mill, The Pas, Manitoba, for Manitoba Environment
- hydrogeologic investigation and preparation of a remediation plan to remove refuse materials formerly disposed of at the Greenwood subway yard on behalf of the Toronto Transit Commission (TTC)
- hydrogeologic investigation of a former manufactured gas plant in southern Ontario
- environmental study and remediation of 4000 t of waste materials from a former wastewater pond and several former disposal areas in connection with the decommissioning of an organic peroxide plant in southern Ontario
- cleanup operation for the Ontario Ministry of Environment (OMOE) involving the recovery and reuse of liquid creosote from pools on the harbor floor of Thunder Bay
- cleanup of coal-tar contaminated sediments at Chippawa Creek for OMOE involving the excavation of about 2000 m^3 of contaminated sediments from the riverbed and shoreline, and decommissioning of a settling lagoon used to temporarily store the sediments and water
- geotechnical and geochemical investigations of coal-tar contaminated sediments both in and along the shoreline of Muggah Creek as part of the management of the Sydney Tar Ponds cleanup for the Nova Scotia Department of the Environment. Also provided technical liaison with the consultant conducting a hydrogeologic investigation of the coke ovens area at SYSCO's steel plant

- hydrogeologic investigation of two contaminated sites and a former landfill area at the Come-by-Chance refinery for Newfoundland and Labrador Department of Environment.

Provided expert witness testimony at the Pennsylvania Environmental Hearing Board in connection with potential groundwater impacts associated with the proposed Dock Street hydro dam and reservoir.

Applied a numerical model (MODFLOW) to assess potential groundwater impacts associated with a proposed dam and reservoir along the Susquahanna River at Harrisburg, Pennsylvania.

Assessed for the Ministry of Mines and Metals of Iran the viability of safely extracting 3500 m^3/d of fresh water over a 30-yr period from sand and gravel aquifer underlain by saline groundwater for ore processing purposes at the Gol-E-Gohar iron mine in southern Iran.

Assessed for the National Iranian Steel Company the proposed extraction of up to 7000 m^3/d of groundwater from alluvium or limestone aquifers for process, irrigation and domestic water supply requirements associated with the Tabas coal mine project in east central Iran.

1984–1986
Postgraduate Student
University of Alberta, Edmonton
Applied a 3D numerical model to theoretically assess the concept of using electrical resistivity theory to delineate and monitor groundwater contaminant plumes using a subsurface grid of electrodes.

1982–1984
Hydrogeologist
Stanley Associates Engineering Limited, Edmonton, Alberta
Evaluated two high capacity production wells (9000 L/min combined supply) developed in fractured bedrock adjacent to the Clearwater River for the Ricinus fish rearing station on behalf of Alberta Fish and Wildlife.

Evaluated a 406-mm dia high capacity production well (9000 L/min supply) developed in floodplain sands and gravels of the Kananaskis River, as a supply for snow-making purposes at the Mount Allan ski development area (1988 Winter Olympics) for Alberta Public Works and Services.

Evaluated groundwater supplies at the Fording Coal Ltd. Genesee Power project, B.P. Canada Inc. flood injection well at Sibbald, Town of Edson, Hilliard's Bay Provincial Park (Phase 2), South Cooking Lake School, Banff Relax Inn and Wolf Creek golf resort.

Evaluated groundwater conditions at two proposed regional landfill sites for the Regional District of East Kootenay, Williams Lake Sanitary Landfills, and

replacement sites for the Clover Bar Sanitary Landfill in the County of Strathcona.

1980–1982
Hydrogeologist
Groundwater Consultants Group, St. Albert, Alberta
Carried out groundwater supply projects at Gulf Canada Resources Gas Plant in Robb, Getty Oil Ltd. flood injection well in Cynthia, Town of Field, British Columbia for Parks Canada, and at Hilliard's Bay Provincial Park (Phase 1).

Assessed groundwater conditions surrounding a brine pond and developed a sanitary landfill monitoring program at Dow Chemical Canada, Fort Saskatchewan plant.

1978–1980
Water Management Supervisor
Lower Thames Valley Conservation Authority, Chatham, Ontario
Supervised the Water Management Program. Duties involved flood contingency planning, monitoring and maintenance of flood warning network, flood forecasting and coordination of emergency response, administration of ARDA dike construction and development of proposed maintenance programs, coordination of channel improvement and bank protection projects, implementation of floodplain regulations and review of municipal plan documents.

1976–1977
Hydrogeologist
W. L. Wardrop and Associates Limited, Bolgatanga, Ghana
Supervised and coordinated groundwater investigations involving the installation of 1200 village handpump wells and 100 town production wells in weathered basement complex of the Upper Region of Ghana (CIDA project).

Technical Publications

Bennett, B. G., Steele, R. J., and Miles, P. C. (1995). "Management of Underwater Contaminated Sediments." 26th Annual H. G. Acres Seminar on Trends in Waste Management, Remediation and Environmental Management, Niagara Falls, Ontario.

Bennett, B. G., Hill, I. K., and Erzinclioglu, A. Z. (1994). "Underwater Cleanup of a Pool of Liquid Creosote" and "Cleanup of a Coal Tar Deposit Using a Vacuum Clam." Dredging '94, 2nd International Conference and Exhibition on Dredging and Dredged Material Placement, Orlando, Florida.

Bennett, B. G., Hill, I. K., Miles, P. C., and Tammemagi, H. (1991). "Remediation of Underwater Contamination." *Hazardous Materials Managements*, Vol. 3, No. 5, pp 6-8.

Bennett, B. G. (1989). "Monitoring Contaminant Plumes in Groundwater Using a Three-Dimensional Grid of Electrodes." M.Sc. Thesis, Department of Geology, University of Alberta, Edmonton.