# Ann Williams // Expression of Interest – President IAEG 2023 - 2026

## Qualifications / Training

BSc University of Auckland, 1987

MSc (Hons) University of Auckland, 1989

COP Resource & Environmental Management, University of Auckland, 1990

COP Hydrogeology, University of Auckland, 1993

## Memberships/ Governance Roles

Board member, Engineering New Zealand, 2022

Fellow Engineering New Zealand 2019

Chartered Member Engineering NZ; PEngGeol since 2013

Member and past Vice President (Australasia), International Association for Engineering Geology and the Environment (IAEG) 2010 - 2014

Life Member and past Chair, New Zealand Geotechnical Society Inc. (NZGS)

Fellow, Geological Society of London

Member, International Association of Hydrogeology

Editorial Boards: Engineering Geology, Quarterly Journal of Engineering Geology and Hydrogeology

## Background

2020 – Operations Manager Geotechnical, Beca Ltd

2017 – 2019 Section Manager, Geotechnical, Beca Ltd

2013 – Technical Fellow, Beca Ltd

2007 – Technical Director, Beca Ltd, Auckland, NZ

2004 – 2007 Associate, Beca Infrastructure Ltd

1992 – 2004 Engineering Geologist/ Senior Engineering Geologist and Hydrogeologist, Beca Carter Hollings & Ferner Ltd, Auckland, NZ

1989 – 1990; 1992 Engineering Geologist, Worley Consultants Ltd, Auckland, NZ

1991 – 1992 World travel

1990 – 1991 Engineering Geologist, Works Consultancy Services, Auckland, NZ

1986 – 1987 Geologist, Department of Scientific and Industrial Research (DSIR), New Zealand Geological Survey, Auckland, NZ

## Management and Governance Experience

### Operations Manager Geotechnical, Beca

I lead and am responsible for the success of Beca's Geotechnical business, comprising some 140+ staff spread across New Zealand. I also support geotechnical staff located in Australia and SE Asia. My role includes strategic and financial planning, supporting the team in winning work, establishing commercial contracts, recruitment and setting a team culture that promotes innovation and delivery of technical excellence.

My personal values of partnership, equity, tenacity and integrity are a part of who I am and how I work.

### Audit & Risk Committee

I have been a member of Beca Group's Audit & Risk committee since 2018. My role on the committee is aimed at ensuring the integrity of the financial reporting and audit process and overseeing the maintenance of sound internal control and risk management systems.

### Board Engineering New Zealand

Engineering New Zealand is New Zealand's body for engineering professionals and the Registration Authority for chartered professional engineers. I was elected to the Board earlier this year as one of 7 external Directors. The Board is responsible for the financial performance, statutory compliance and activities of Engineering New Zealand, together with the employment of the Chief Executive.

## Selected Technical Experience

**Central Interceptor, Ghella Abergeldie Joint Venture for Watercare (2019- ongoing)**

Ann worked with the GAJV and Arup to pursue and win Watercare's Central Interceptor project, a 14.7 km long, 5 m diameter wastewater tunnel with 17 drop and working shafts; and is verification lead (hydrogeology) and project director through the design and construction phase. Tasks have included assessing groundwater issues related to the proposed construction techniques, verification of 3D groundwater modelling, development of Monitoring & Contingency Plans to meet resource consent conditions related to groundwater drawdown and consideration of settlement effects of tunnelling beneath a State Highway.

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**Groundwater Expert Additional Waitemata Harbour Crossing, NZ Transport Agency (2016 – 2018)**
Advised on the potential effects of a range of alignment options and configurations on groundwater through an MCA process to aid selection of an alignment to be taken through to the obtaining of designation approvals. Guidance of numerical groundwater modelling and qualitative assessment of the effects of deep tunnelling and cut and cover tunnelling on groundwater.

**Groundwater Expert, East West Link, NZ Transport Agency (2014 – 2017)**
The project is a joint NZ Transport Agency and Auckland Transport programme to improve freight efficiency, commuter travel, public transport and walking and cycling options over the next 30 years in the area between Onehunga, Penrose, East Tamaki and Auckland Airport. Ann was the groundwater specialist evaluating likely effects of the six options on groundwater flow and level. The selected option encroaches on the foreshore but was chosen for its superior transport performance and better resilience and endurance. Ann guided ground and groundwater model development and assessment of effects of construction of the road embankment over and in front of existing closed landfills, on groundwater.

**Groundwater Lead, MacKays to Peka Peka Expressway, Wellington, NZ Transport Agency 2011 – 2017**
Guidance of investigations and 2D and 3D groundwater modelling to assess the potential effects of the Expressway embankments constructed by surcharge/ preload or excavation/ replacement techniques over peat, cuts in sand, stormwater devices, and groundwater take for construction, on the existing groundwater regime. Expert witness presenting technical evidence to the Board of Inquiry. Groundwater Lead in the Alliance delivering this project.

**Lead Hydrogeologist, Western Ring Route - Waterview Extension, NZ Transport Agency (2006 - 2016)**
Direction of 2D and 3D groundwater modelling to assess likely groundwater drawdown and inflows, both during construction and in the long-term for a 3 km length of "shallow" cut and cover tunnel and for a 4 km long "deeper" driven tunnel, as well as the potential for contaminant transport from old landfills and the potential for effects on Oakley Creek. Expert witness presenting technical evidence to the Board of Inquiry. From 2012, verifier (groundwater) for detailed design and delivery of the tunnels as part of the Well Connected Alliance.

**Kāpiti Water Supply Project, Kāpiti Coast District Council, New Zealand, 2009 – 2017 (CH2M Beca)**
The project objective was to secure an enduring water supply solution to meet Kāpiti Coast's urban water needs for the next 50 years. Water source options included surface water (run-of-river and dams), groundwater, and alternative river recharge options using recycled wastewater, groundwater or inter-catchment transfers. River Recharge with Groundwater was selected as the preferred solution. Key tasks have included testing of existing wells, drilling of new abstraction and monitoring wells, 3D modelling of effects of groundwater take, preparation and implementation of a monitoring plan.

**Engineering Geologist/ Stronger Christchurch Infrastructure Rebuild Team (2011 - 2015)**
Technical review of assessments of slope stability, rock fall risk and mitigation design, including for McCormack's reservoirs, impacted by rockfall from above and debris slides below the reservoirs, and the Huntsbury Reservoir, beneath which she identified a shear zone, confirmed through trench and inclined borehole investigations.

**Victoria Park Tunnel, Auckland, NZ Transport Agency, 2005 – 2007; 2009 – 2011**
Lead engineering geologist and hydrogeologist for the concept design and resource consenting of twin three-lane motorway tunnels built by cut and cover techniques. Review of geological model and direction of hydrogeological aspects of design and consenting the northbound tunnel including assessment of the impact of different tunnel designs on regional groundwater flow; inflows to the tunnel and the potential for contaminant migration or saline intrusion. Preparation of expert evidence; expert witness supporting the consent application through mediation. In team lead reviewer for groundwater aspects of the design-build phase of the project and monitoring of effects.

**RCEP Water Management Study, Queensland, Australia, Glencore, 2013 – 2014**
Lead hydrogeologist assessing groundwater effects of proposed deep pit coal mining strategy, from 2013 to 2024 as part of the Feasibility Study. Study includes direction of 3D groundwater modelling of the staged development through to end of mine life (50 plus years), calculation and management of stream diversions and pit inflows, levee and cut-off design.

**Hunua No. 4 Watermain, Auckland, NZ, Watercare, 2010 - 2014**
Direction of investigation of groundwater in the vicinity of Watercare's proposed watermain **(which would** extend from the Redoubt North Reservoir in Manukau Heights to Epsom**)** and of 2D groundwater modelling of effects of trench construction on groundwater. Guidance of 3D

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groundwater modelling of trenchless crossings beneath road and rail. Presentation of Expert evidence at the Council Hearing. Development of a monitoring programme for the pre-, during and post-construction periods. Guidance to the team constructing the pipeline on management of water inflows and need for trench stops.

**Lead Hydrogeologist, Eden Park Rugby World Cup, Auckland Council, (2009–2011)**
Auckland City was required to manage a 1:10 year rainfall at Eden Park playing fields to meet criteria for World Cup hosting. Scoping and direction of investigations, analyses and computer modelling; consenting, implementation and delivery of the scheme centred around development of large diameter wells from which water is abstracted and discharged prior to a game to allow rainfall during a game to be stored in the aquifer below ground.

**Lead Hydrogeologist, CBD Rail Loop, Auckland, On-Track, NZ Railways Corporation, (2009 - 2010)**
Lead engineering geologist and hydrogeologist in a team investigating selected rail tunnel alignment options for a rail 'loop' between Britomart Station and Newton for NOR. Included guidance of investigations and preliminary 3D modelling of three stations to assess likely extent of drawdown induced ground settlement effects.

**Lead Engineering Geologist, Waitahora Windfarm, Contact Energy, NZ (2009 – 2010)**
Engineering geological expert guiding investigations and geological mapping of large areas of past and current slope movements, faulting and karstic terrain; participation in court-assisted mediation; presentation of evidence at the Environment Court.

**Lead Engineering Geologist and Hydrogeologist, New Lynn Rail Box, Auckland Kiwi Rail (2007 – 2010)**
In an ECI team to deliver a 1200 m long underground railway station (including a 720 m long Rail Box) at New Lynn. Key tasks included review of analytical models and concept design; development of supporting documentation for the AEE and applications for resource consents for earthworks and taking and diverting groundwater; direction of 2D- and 3D- groundwater modelling to assess groundwater drawdown, associated settlement effects, excavation inflows, uplift pressures beneath the box, damming of groundwater upgradient of the box and monitoring requirements; Review of monitoring data during construction.

**SH1 Blenheim to Ashley River Strategy Study, NZ Transport Agency, South Island, NZ (2008 – 2009)**
Identification of areas of engineering geological and geotechnical risk to the alignment and mitigation solutions for most vulnerable ranked sites; prioritisation for input to 5- and 10- year implementation plans and 30- year strategy.

**Mt Kare Mine Pre-Feasibility Project, Buffalo Gold Ltd, Papua New Guinea (2007)**
Pre-feasibility study and preliminary design of infrastructure for development of a gold mine site in the highlands of PNG, sufficient for a level 2 cost estimate. Challenges included design of slopes identified from geomorphic mapping to have been subject to significant slope movement historically in an area of very high rainfall and high seismicity.

## Selected Technical Publications

Prebble, W.M., Williams, A.L. 2016: Block Slides on Extremely Weak Tectonic Clay Seams in Openly Folded Tertiary Mud-rocks at Auckland and the Rangitikei Valley, North Island, New Zealand. Rock Mechanics & Rock Engineering 49 (6): 2217-2234.

Williams, A., Gibson, M., Gilmer, G., 2012: Seismically Induced Rock Fall, Christchurch, New Zealand: The Effects of Large Vertical and Horizontal Accelerations. Proceedings of the 11th International & 2nd North American Symposium on Landslides Banff, 2012.

Williams, A., France, S., Burr, J., 2011: Assessment of Ground Settlement Effects Due to Tunnel Construction in a Complex Urban Hydrogeological Setting. Key-note presentation in proceedings of Environmental Geosciences and Engineering Survey for Territory Protection and Population Safety, 2011.

Williams, A.L., Pinches, G.M., Chin, C.Y., McMorran, T.J., Massey, C.I. (editors) 2010: Geologically Active. Proceedings of the 11th IAEG Congress, Auckland, NZ, September 2010. CRC Press/Balkema, 341p + CD.

Toan, D.V., Williams, A.L. 2007: Retention for Major Excavations. Proceedings of the 10th Australia New Zealand Conference on Geomechanics, Brisbane, 2007.

Burns, D., Farquhar, G., Mills, M., Williams, A.L., 2005: Guideline for the field Description and Classification of Soil and Rock. New Zealand Geotechnical Society Publication

## Strengths

I believe my strengths are:

**adaptability**: work well where shifting priorities and changing plans are the norm

**strategic**: create alternative ways to proceed/ range of solutions

**achiever**: stamina, work hard, satisfaction from being busy and productive

**activator**: make things happen by turning thoughts into action; honest about what can and can't do

**ideation**: don't accept at face value; examine things from different angles