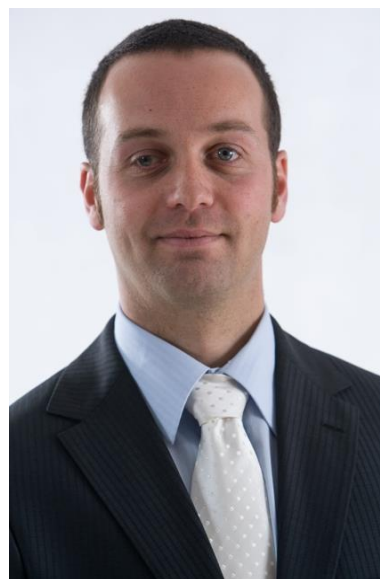


# Anthony John Barthelmess

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## Qualifications

- Diploma of Structural Engineering, 2000 (SIT, Ultimo).
- Masters of Civil Engineering, 2009 (University of Wollongong).
- Statutory Underground Coal Ventilation Officers Certificate of Competency for NSW and QLD (University of New South Wales).
- *Committees & Memberships:* Member Institute of Engineers Australia, Australian Rainfall & Runoff Project 11 Blockage Committee,
- *Professional Activities:* Guest Lecturer at UOW
- Recipient of several NSW and National industry awards for Excellence in Stormwater Management.



## Experience

- |                       |   |
|-----------------------|---|
| <b>2015 – Current</b> | <b>Managing Director – Rienco Consulting.</b><br>Managing Director of regional consulting water and civil engineering firm.   |
| <b>2012 – 2015</b>    | <b>Gas &amp; Ventilation Engineer, BHP Billiton / South32 / Appin Mine</b><br>Responsible for management of underground ventilation and surface gas drainage activities at Appin Mine and managing the ~\$6M annual capital works program. Appointed Statutory Ventilation Officer at Appin Mine. Role included the design, drilling, installation and operation of surface gas drainage wells and gas drainage plants. |
| <b>2009 – 2011</b>    | <b>Project Director – Cardno NSW Pty Ltd</b><br>Responsible for leading a large team of employees and sub-consultants to deliver major Part 3A projects across NSW.   |
| <b>2006 – 2009</b>    | <b>Project Manager – Cardno Forbes Rigby Pty Ltd</b><br>Lead flood and water modeller supporting large scale urban development and civil infrastructure projects.   |
| <b>2002 – 2005</b>    | <b>Civil Designer – Forbes Rigby Pty Ltd</b><br>Civil designer on a range of civil engineering projects, involving all facets of project delivery from concept design through to site supervision and contract admin.   |
| <b>2000 – 2001</b>    | <b>Project Engineer – GHD Pty Ltd</b><br>Role involved preparation of civil design plans and specifications for large design and construction contracts and large scale civil infrastructure.   |
| <b>1996 – 2000</b>    | <b>Project / Construction Engineer – MPN Group Pty Ltd</b><br>Prepared civil designs for multiple Westfield Shopping Centre external works. Role also involved extensive site supervision across Australia.   |

## Expert Witness Experience

- Class 1 Land & Environment Court Proceedings 10649 of 2015 (Develop My Land Pty Ltd vs Wollongong City Council). Acted for the applicant relating on flood related matters for a 5-unit development on residentially zoned land in Coledale, NSW. Flood related matters were successfully resolved for the applicant at the Section 34 conference.
- Class 1 Land & Environment Court Proceedings 10337 of 2006 (Neate vs Shellharbour Council). This project involved the creation of 1D and 2D flood models for confirmation of flood behaviour in support of a development application for a Seniors Living complex in 2006. The client then litigated in the L&E Court (for which Expert Witness services were rendered) to obtain a DA, which was successful in 2007.
- Class 1 Land & Environment Court Proceedings 11377 of 2005 (Neate vs Wollongong City Council). This project involved creation of 1D and 2D flood models in support of a development application for a Seniors Living complex. The client litigated in the L&E Court (for which Expert Witness services were rendered) to obtain a DA, which was successful, pending the development of a Flood Warning System (FWS). A FWS was developed, but again litigation was considered the only way of furthering the Development Consent. This further phase involved the additional Expert Witness Statements and participation in Joint Expert Witness Conferences with Council and the SES and attendance in Court.
- Class 1 Land & Environment Court Proceedings (Wakim vs RTA). This project involved compensation of supposed flood affected land up for Compulsory Acquisition by the RTA. The work involved determining the 'highest and best use' of the land with regard to its flood affectation. Acting for Mr. Wakim, the matter was resolved successfully.
- JRPP and PAC Appearances. Various appearances at Joint Regional Planning Panel and Planning & Assessment Commission to provide evidence /submissions for Major Part 3A land development projects (relating to flooding).

## Hydrology and Hydraulics Experience

- Hewitts Creek Flood Study and Floodplain Risk Management Study for Wollongong City Council (2002 ongoing).
- Duck Creek Flood Study for Tallawarra Lands/TRUenergy. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS and TUFLOW) model of Duck Creek with a complicated arrangement of flood storages and diversions.
- Calderwood Flood Study for Delfin Lend Lease. Catchment wide hydrology (WBNM) and hydraulic (TUFLOW) model of Macquarie Rivulet, calibration and validation, and development of a FPRMS.
- Vincentia Flood Study for Stockland Developments. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS) model of a sensitive Vincentia catchment discharging into St Georges Basin.
- Forde Estate Flood Study, Canberra for Canberra Investment Corporation. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS) model of for a catchment with ~650 lots proposed.
- Central Hills Rezone for Camden Council. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS) modelling of an open pasture catchment at Narellan, for proposed 1,000 lots.
- Bulli Dam Investigation for Multiplex. Hydrologic investigation into various over-topping scenarios up to the PMF.
- Flood Study for Proposed Woolworths Supermarket, Princes Highway Bulli. Prepared flood study including detailed site inspections of diversions structures, full hydrologic

study including detention basins, blockage scenarios and diversions (WBNM). The area is quite complex due to diversions at each hydraulic structure combined with the Illawarra Railway line acting as a large weir immediately downstream of the site. Study also required detailed hydraulic model and determination of flood risk precincts to Councils DCP54.

- Mt Ousley Bulli Pass Upgrade Study, Wollongong for RTA. Project involved GPS survey using differential GPS and handheld unit on existing culverts for Main Road 95 and 513 (Mt Ousley Road and Bulli Pass) using GIS based field method. Undertake hydrologic (WBNM) and hydraulic (HEC-RAS) calculations based on field captured data and hydrologic/hydraulic analysis.
- Drainage Study of Marrickville Industrial Estate for Marrickville Council. Responsible for modelling and documentation of over 1,500 stormwater pits and pipes, detention basins, open channels and weirs. Assistant Modeller using DRAINS for Marrickville City Council simulating complex flow diversions and flow paths.
- Macquarie Rivulet Flood Studies (various). Several hydraulic models (HEC-RAS and FESWMS) of Macquarie Rivulet lower flood plain to determine previously unknown effects of the PMF event on future development. Preparing flood reports and compliance with the many varying requirements in place in the Illawarra (local DCP's, FDM2005, FMM 2001 etc).
- Review of Lake Illawarra Flood Study and Floodplain Risk Management Study. Review and provide comment to Lake Illawarra Authority on the impacts and technical points of conflict in the Lake Illawarra Flood Study and Risk Management Plan. With respect to appropriate freeboard, the effects of filling around the lakes, entrance conditions etc.

## Water Quality and WSUD Experience

- Water Sensitive Urban Design Study, Calderwood Urban Development Project (2010). Lead author of the Water Sensitive Urban Design Study of the Environmental Assessment for the Calderwood Urban Development Project. Involved protracted negotiations with DoP, the PAC and peer review processes to ensure the successful Project Application.
- Water Sensitive Urban Design Study, Bayswood Development, Vincentia (2007). Lead author of the Water Sensitive Urban Design component of the Environmental Assessment for the Bayswood Development (State Significant Major Project). The major project application was successful and additional reporting was required to assess the Director General Requirements and prepare the Project Application. Detailed designs were then prepared and the wetland and environmental protection measures began construction late 2007.
- Water Sensitive Urban Design Study, Sandon Point Development (2007). Lead author of the Water Sensitive Urban Design component of the Environmental Assessment for the Sandon Point development (State Significant Major Project). A detailed Climate Change assessment on increased flood risk and coastal erosion was also undertaken. Involved protracted negotiations with DoP and peer review processes to ensure the successful Project Application.
- Forde Estate Wetland Concept Design, ACT (for Canberra Investment Corporation CIC, 2006). Lead designer of over 4 ha of wetlands and ponds for a new residential estate near Gungahlin in ACT. The wetlands are capable of treating over 400 ha of cleared and developed catchment to below existing nutrient levels. Detailed WBNM, HEC-RAS and MUSIC modelling was required to afford the development team a certain level of confidence regarding the approach taken by the design.
- Central Hills Rezone – Water Cycle WSUD Study for Camden Council (2005-06). This study was prepared in support of a rezone of agricultural land to urban release. The

study contained a detailed water cycle analysis (including preparation of detailed water balance models) and a full assessment of water quality and WQM objectives. Also of note was the heritage water supply canal structures traversing the site, and the ever present salinity problem in western Sydney.

## **Project Management and Superintendent Experience**

- Nan Tien Temple / University (Wollongong). Site Superintendent and Contract Preparation and Administration for the ground consolidation and civil works (Contract value = ~\$6M).
- Tullimbar Subdivision (Wollongong). Site Superintendent and Contract Preparation and Administration for a 2km riparian area and first two residential stages ~100 lots (Contract value = \$10M).
- Haywards Bay Subdivision (Wollongong). Site Supervision of several 40 lot stages of the subdivision and two RTA bridges.
- Stockyard Creek Subdivision (Wollongong). Site Superintendent and Contract Administration for a riparian area 65 lot residential stage (Contract value = \$1.5M).
- Various University of Wollongong Infrastructure. Site supervision and Contract Preparation and Administration for 250 space carpark and extensions to Building 40 (\$5M).
- Westfield Warrawong (NSW), Westfield Hornsby (NSW), Westfield Southlands (VIC) and Westfield Tea Tree (SA). Supervision and Contract Administration for all external works such as alterations and additions to existing roads, carparks, external roundabouts, stormwater drainage and pavement reports and rehabilitation.

## **Urban Development and Civil Engineering Experience**

- Lead Designer and Site Superintendent – Stockyard Creek Subdivision, Albion Park. Role involved the design of over 120 lots in three stages, trunk infrastructure, riparian areas and RTA road upgrades.
- Lead Designer and Site Superintendent – Nan Tien Temple. Role involved the design of the remediation of an old landfill to enable the new University to be constructed. This project utilized ~500,000 m<sup>3</sup> of coalwash emplacement.
- Lead Designer and Site Superintendent – Tullimbar Village. Role involved the design of over 1,500 lots, trunk infrastructure, 2km of riparian areas and RTA road upgrades.
- Lead Designer and Site Supervision – Hayward's Bay Subdivision, Albion Park. Role involved the design of over 450 lots in eight stages, trunk infrastructure (including vacuum sewer) and RTA road access including two bridges. This project involved over 800,000 m<sup>3</sup> of coalwash emplacement.
- Energy Australia 132kV Cable Cross-City Tunnel. Responsible for design, documentation and design/construct contract preparation of 1.3km cross city tunnel and portals.
- Somerton Power Station. Responsible for design and documentation of a complex road network and services arrangement at Somerton Power Station.

## **Mining Experience**

- Statutory Appointed Ventilation Officer at Appin Mine. Completion of all statutory responsibilities, monthly ventilation surveys, P/Q surveys with electronic barometers, financial planning and reporting.

- Surface Gas Drainage – Design, construction and operation of gas boreholes, gas drainage plants and monitoring infrastructure.
- Stage 3 Coalwash Emplacement Project, West Cliff Colliery. This project involved the engineering design and construction supervision of \$33M of construction works to support the ongoing stages of Illawarra Coal's Stage 3 emplacement. The project involved construction liaison with the Contractor and in excess of 200,000 m<sup>3</sup> of earthworks, two 45ML dams and 7 km of surface water diversion drains.
- Dendrobium Drift (North-West Mains, B Heading 12-20ct) Pavement Design Inbye of Wongawilli Seam fault (500m length).
- Appin Area 7 Longwall 704 2km sub-surface MRD drill and well-head extraction design and Goaf Gas Extraction Plant Detailed Design.
- Appin Area 9 Vent Shaft 6 Drilling Site Layouts, and Appin Area 9 Tailgate 901 STIS 2.2km drill hole and drill pad designs.
- Mine Closure Plans and Cost Estimates for Cordeaux, Dendrobium and Processing/Logistics sites.

## Publications

Weeks, W, Barthelmess, A.J, Rigby, E.H, Witheridge, G and O'Loughlin, G. 2013. "*Blockage of Hydraulic Structures – Stage 2 Report*". ISBN 978-0-85825-956-0, Prepared for Engineers Australia for Australian Rainfall and Runoff revisions.

McIntosh, G.W. and Barthelmess, A.J. 2013. "*Building on an old landfill: design and construction*". Proceedings 18<sup>th</sup> Int. Conf. on Soil Mechanics and Geotechnical Engineering, Paris.

McIntosh, G.W. and Barthelmess, A.J. 2012. "*Reclamation of an old landfill at Unanderra, NSW*". Proceedings Int. Conf. on Ground Improvement and Ground Control, Wollongong, Australia October 2012. (Invited Paper).

Barthelmess, A.J. and De Jong, O. 2011. "*When are Impacts on Flooding Non-Detrimental? Implications of Development in Flood-Prone Sites*". Proceedings of NSW SIA Conference, Hunter Valley, September 2011.

De Jong, O. and Barthelmess, A.J. 2011. "*Major Flood of March 2011: 1 in 100 year Wipeout for Warilla*". Proceedings of NSW SIA Conference, Hunter Valley, September 2011.

Barthelmess, A.J. and Rigby, E.H. 2011. "*Estimating Culvert Blockages – A simplified Procedure*". 34<sup>th</sup> World Congress of the International Association for Hydro-Environment Engineering and Research (IAHR) 26 June – 1 July, 2011.

Rigby, E.H. and Barthelmess, A.J. 2011. "*Culvert Blockage Mechanisms and their Impact on Flood Behaviour*". 34<sup>th</sup> World Congress of the International Association for Hydro-Environment Engineering and Research (IAHR) 26 June – 1 July, 2011.

Barthelmess, A.J. and Nichols, P.S. 2010. "*The Development of a Predictive Flood Warning System to Manage Flood Isolation Risk for Lake Illawarra*". Proceedings of 50<sup>th</sup> Annual Floodplain Managers Conference, Gosford 2010.

Barthelmess, A.J. and Rigby, E.H. 2009. "*Quantification of Debris Potential and Evolution of a Regional Culvert Blockage Model*". Proceedings of H2009 - 32nd Hydrology and Water Resources Symposium, Newcastle NSW, November.

Weeks, W, Barthelmess, A.J, Rigby, E.H, Witheridge, G and Adamson, R. 2009. "*Blockage in Drainage Structures*". Proceedings of Hydrology and Water Resources Symposium, Engineers Australia, Newcastle.

Nichols, P.S., Barthelmess, A.J. and Webber, K. 2008. "*Merit-based Design in Floodplain Management*". Proceedings of 48<sup>th</sup> Annual Floodplain Managers Conference, Wollongong 2008.

Weeks, W, Barthelmess, A.J, Rigby, E.H, Witheridge, G and O'Loughlin, G. 2009. "*Blockage of Hydraulic Structures – Stage 1 Report*". ISBN 978-085825-9539, Prepared for Engineers Australia for Australian Rainfall and Runoff revisions.

Barthelmess, A.J. 2007. "*Geomorphology and Urban Stream Rehabilitation: Principles in Practice*". Proceedings of Stormwater Industry Association National Conference, Wollongong 2007.

Barthelmess, A.J. 2007. "*Using GIS to prioritise culvert upgrade*". Proceedings of Stormwater Industry Association National Conference, Wollongong 2007.

Barthelmess, A.J. and Nichols, P.S. 2006. "*A Framework for Culvert Upgrade and Assessment in GIS: An Engineers Approach*". Proceedings of 1<sup>st</sup> OZRI – National GIS Conference Melbourne 2006.