WILLIAM J.C. MEYNINK

BE, MEngSc, MIE Aust, CPEng, RPEQ

Country of Citizenship:	Australia
Educational Qualifications:	BEng (Ag), University of Southern Queensland, 1971 MEng (Sci), University of New South Wales, 1975 Forensic Engineering, New South Wales Institute of Technology, 1975 Sediment Mechanics, Colorado State University, 1980
Professional Associations:	Registered Engineer, Queensland Member, International Association of Hydraulic Research Member, Institution of Engineers, Australia
Awards:	Institution of Engineers 1994, John Alexander Medal for a significant contribution to the Engineering Hydrology literature. Institution of Engineers 1994, Warren Medal for a significant contribution to the Civil Engineering literature.

FIELDS OF SPECIAL COMPETENCE:

His fields of specialty and interest are:

- Equatorial Hydrology – water supply, flood estimation
- Super critical hydraulics, energy dissipater and sedimentation basin design
- River Engineering
- Tailings Disposal
- Physical and numerical modelling of hydraulic and hydrological phenomena
- Water Management Studies, and
- Hydrological aspects of environmental impact assessment and environmental audits.

EMPLOYMENT:

1993 – Present
Principal - Pells Sullivan Meynink, Brisbane

1991 – 1993
Director – Hydrocomp

1987 - 1991
Principal Consultant Hydrology - Minenco Pty Limited

1981 - 1987
Director - Hydrocomp

1979 - 1980
Senior Hydrologist - Bougainville Copper Limited, Papua New Guinea

1976 - 1978
Lecturer in Water Engineering - University of Southern Queensland

1973 - 1975
Water Research Laboratory - University of New South Wales, Project Engineer

PROJECTS

Kelian Equatorial Mining, East Kalimantan – Mine closure hydrology & hydraulics.

MT Isa Mines, QLD:- Dirty water detention dams & pumping system evaluation

Sabodala Mining;Senegal, West Africa:- Mine water supply assessment & design.

Batu Hijau, Sumbawa, Indonesia – Hydrology and pumping requirements for Katala Pond.

Glennies Creek Colliery, NSW – Mine water management, hydrogeological design of Possums Skin dam.

Mineral Sands, Senegal, West Africa – Analyses of water balance in sequential sand dredging operations.

PT Freeport Indonesia – Fairy Lakes Water Balance study. Monitoring and analysis for mine impacts.

Kaltim Prima Coal, Indonesia – Review of short and multiday design rainfall criteria.

Transfield Obayashi JV- Burnley Tunnel remediation grouting.

Morobe Gold (PNG) – Process Plant Water Supply. Hydrology, pump station design. Erosion and sedimentation impacts associated with construction and operations.

Cosila Coal Project (Venezuela) – Feasibility design of clean and dirty water management systems.

Guniamo Diamond Project (Venezuela) - Feasibility design of clean and dirty water management systems.

Mine Subsidence – Impact of long wall mining on the low flow hydrology of the Cataract River, NSW report for legal council.

PT Freeport Indonesia – Acid Rock Drainage and Waste Dump Hydrologic study. Field measurement, laboratory model and numerical model studies.

PT Freeport Indonesia – Grasberg Hydrogeological ground and surface water modelling study for pit dewatering and mill water supply. Field measurement and surface water hydrological component.

PT Bengalon Coal (Indonesia) – Feasibility Study Design of Waste Dump and Mine Drainage System.

Central Qld Mines – Blackwater creek diversion, hydrologic and hydraulic design of 1000 cumec diversion channel.

Stratford Coal - Mine Salt and Water balance Modelling. Water use strategies. Design of diversion channels and dams. Siltation control.

Duralie Coal Project - Mine Salt, Sulphate, Water and Sediment Control Modelling. Hydraulic design of diversion structures.

Freeport Indonesia - Water Supply for Mill Expansion. Peer review of tailings disposal study. Modelling of tailings transport and deposition to define long term impacts and evaluate disposal alternatives.

Kaltim Prima Coal Pty Ltd - Hydraulic & Hydrologic studies for dam and stream diversion for river valley mining. Design of beached coal washery tailings disposal system. Review of hydrologic design criteria, revision of flood estimation manual.

PT Kelian Equatorial Mining – Environmental Audit Team Member

Bougainville Copper Ltd.- Feasibility design of 150,000 tpd coastal tailings disposal system. 3D simulation on annual basis.

Kelian Equatorial Mining Pty Ltd - Design of Gold Tailings Disposal System (20,000 tpd) - transport and deposition patterns, filling curves, water budget, cyanide decay and dilution, spillway design floods. Probable maximum precipitation. Dam burst flood study. Hydrometeorological network design and establishment. Hydrometeorology design manual. Impact of river diversion and gravel extraction. Acid mine drainage prediction and amelioration. Kelian river diversion design for pit expansion. Hydraulic design of spillways and energy dissipators.

Capitol Castings Pty Ltd, Arizona, USA - Design, implementation and monitoring of a remediation plan for petrol contaminated groundwater.

Nova Coal Pty Ltd - Saline groundwater management. Study of alternatives including pipeline, evaporation ponds, power station cooling lakes and groundwater injection.

Hidden Valley Gold Pty Ltd - Tailings disposal options, river sedimentation, cyanide dilution and decay. Morphology and sediment sources and sinks in the Bulolo – Watut - Mahakam river system. Tailings dam water budget/cyanide decay. Hydrometeorological network, flood estimation manual. Environmental impact assessment.

Pt.Kaltim Prima Coal Pty Ltd - Hydrometeorological network design and establishment. Software Users manual. Tailings dam - hydrology design.

Pacific Coal Pty Ltd (Kunioon Coal) - Flood study mine development feasibility report.

Ditmar Gold - Tailings management review.

Mt Kare Mining Pty Ltd - Water supply, stream flow duration curves, river sedimentation, tailings transport and deposition. Environmental impact assessment.

Hydrological Monitoring System, Bougainville PNG: Supply and installation of distributed monitoring network: 4 water levels, 4 rainfalls and 2 wind speed and direction recorders. Computer system and processing software.

Flood studies, Brisbane, Queensland: Review of flooding behaviour on an urban catchment and identification of drainage works necessary to facilitate development.

Hydrological analysis ash dams and process water supply Stanwell Power Station, Queensland, Australia.

River Sedimentation, Jaba River, Bougainville, PNG: Numerical model studies of river sedimentation. River response to various tailings input strategies.

Channel re-alignment, Cubberia Creek, Queensland, Australia: 1/50 scale model of pre and post development. Minimum energy entrance and super-critical channels. Companion hydrological studies for design flood assessment.

Flood studies, Petrie Creek, Queensland, Australia: Calibration of upland catchment runoff routing model, establishment of design floods. Calibration of unsteady flood plain model for prediction of design flood heights.

Flooding deposition and scour, Umbiram Creek, Queensland: Preparation of material for legal counsel and appearance as expert witness.

Pit surface and groundwater studies, Bougainville, PNG: Review of pit response to rainfall. Establishment of monitoring network.

Hydraulic model studies, Tanango Creek, Bougainville, PNG: Physical hydraulic model studies of sediment basin, energy dissipaters, super-critical channels and chutes.

Bay geomorphological studies, Empress Augusta Bay, Bougainville Island: Assessment of existing beach forming process, numerical modelling of wave refraction diffraction processes. Estimation of short and long term changes in beachline shape associated with bay disposal of tailings.

River aggradation, Jaba River Bougainville, PNG: Further refinement of sediment model, assessment of long term river response to changes in levee location, flow diversion and tailings sizing.

Rainfall Runoff Model Studies, Central Queensland: Development and calibration of rainfall runoff model for mine water supply flood control and environmental assessment.

Real Time Flood Warning System, Bougainville, PNG: Development of real time telemetering flood warning system. Project involved both hardware and software development based on an HP 85 computer.

Estuarine disposal of tailings, Empress Augusta Bay, Bougainville, PNG: Field survey of bed sediments, waves and currents to determine the ultimate fate of colloidal material associated with river discharge of tailings.

Hydraulic Design, Pan Creek Diversion, Bougainville , PNG: Hydraulic model studies for creek diversion involving super-critical flow chutes, bends, dissipaters and culverts.

Waste Dump Hydrology, Bougainville, PNG: Assessment of the distribution of flows within waste dumps to evaluate the likely increased leachate yields due to irrigation.

Littoral Drift Empress August Bay, Bougainville, PNG: Construction of groin and field survey monitor to assess the longshore movement of sand under wave and current action.

Hydrological Analysis, Trinity Inlet, Cairns, Queensland: Analysis of historic flooding due to levee construction and inadequate drainage facilities. Report preparation for legal counsel.

Extreme wind gusts, Bougainville, PNG: Assessment of extreme wind gusts for building design and insurance cover.

Flood Studies, Gold Coast, Queensland: Establishment of design flood discharges and levels for urban development.

Hydraulic Model Studies, Bougainville, PNG: 1:30 and 1:25 physical model studies of river diversion for pit expansion involving super-critical bends, energy dissipaters and sediment traps.

Flood plain development studies, Boggabri, New South Wales, Australia: Preliminary evaluation of changes in flooding behaviour associated with the construction of railway embankment for a coal spur line across the Namoi Valley flood plain.

Tailings Disposal Studies, Bougainville, PNG: Evaluation of alternative disposal strategies including pipelines, pipeline with thickened disposal, river disposal with dredging , river disposal with finer grinding. A numerical model of tailings transport in the river system was developed to predict river response to changes in both the size, consistency and tonnage of tailings input.

Crak Creek Flood Studies, Bougainville, PNG: Estimation of flood heights and areas of inundation.

Pit Flood Studies, Bougainville, PNG: Study of depths and frequencies of pit flooding as a function of drop cut size and inlet tunnel dimensions.

Waste treatment and disposal, Cannon Hill Abattoir, Brisbane: Review of existing treatment plant performance, modifications for improvement.

Dau Valley Reservoir, Bougainville, PNG: An assessment of the ability of a proposed dam to reliably supply water to meet the mining needs of Bougainville Copper Limited.

Cerito Creek Dam, Queensland, Australia: An examination of the catchment rainfall runoff behaviour and assessment of the availability of the proposed dam to reliably supply water to a new coal mine/township complex.

Groundwater Movement Studies, Bougainville, PNG: Determinations of lateral and longitudinal movement of groundwater in tailings deposits as a component of chemical and environmental studies.

Flood Retardation Basin Studies, Bougainville, PNG: Feasibility study of a flood retention basin on the Jaba River for flood protection and improved sediment transport.

Dambreak Flood Studies, Clarrie Hall Dam, New South Wales, Australia: Estimation of likely outflow hydrographs from a breached rockfill dam, an investigation of the celerity and attenuation of the dambreak floodwave as it travels downstream; numerical and physical models were used to estimate the likely event of flooding and the warning time available should the dam be breached during construction.

Hydraulic Model Studies, Bougainville, PNG: 1:30 scale model of stilling basin, culvert, chute and energy dissipater.

Hydrological Studies, Bougainville, PNG: Design flood discharges and heights, flood levees, water supply, water quality and sediment for a proposed lime plant on the Arkawa River.

Sediment Transport Studies, Bougainville: Numerical modelling of tailings transport along the Kawerong-Jaba Rivers to assess likely benefits from finer grinding and river training.

Long-term Tailings Disposal, Bougainville: Supervision of multi-disciplinary investigations into alternative strategies for tailings disposal.

Hydraulics Model Studies, Bougainville: Design, construction and testing of physical scale models for open channel bends, contractions and energy dissipaters for super-critical flow along the Kawerong River.

Pumped Storage Studies, Bougainville: Feasibility study of a pumped storage to augment mine water supply. Study involved the collection, collation and analysis of available hydrological data and the development of a simulating model.

Behaviour of Tailings Pipeline, Bougainville: Theoretical and experimental studies to determine critical non-deposit velocities and friction factors for 1.2 m diameter tailings pipeline.

Flood Estimation Studies, Bougainville: Development and testing of a flood estimation procedure; design and installation of gauging stations; preparation of flood estimation manual.

Pine Rivers Sand and Gravel Study, Brisbane, Australia: Specialist advice on sediment transport along the Pine River.

Soil conservation measures, Queensland, Australia: Studies on soil conservation, drainage and flood estimation for the Darling Downs area.

Tidal Barrage, North Queensland, Australia: Physical model studies of the feasibility of construction of a tidal barrage across the Emberly River; estimation of design wave heights under cyclonic conditions.

Ramu 1 Hydro-Electric Station, Papua New Guinea: Physical model studies of hydraulics of turbine offtakes.

Paradise Point Flood Studies, Queensland, Australia: Investigations of effects of urban development of tidal flows, flood levels, siltation and scour.

"Star Kerry" Investigations, Sydney, Australia: Investigations into the causes of the severe rolling and subsequent loss of deck cargo experienced by the vessel "Star Kerry" during a severe storm in Sydney Harbour.

'Ashmore Water' and 'Nerang Waters' Flood Studies, Queensland, Australia: Investigation of the effects of proposed urban developments of flood levels in Nerang River.

Cape Jervis Ferry Terminal, South Australia: Physical model study to investigate feasibility of construction of ferry terminal.

Botany Bay Project, Sydney, Australia: Design, construction and verification of physical model of the Georges River and Botany Bay for Australian Academies of Science, Social Science and humanities.

JOURNAL AND CONFERENCE PAPERS; RESEARCH REPORTS

1. "Critical Durations for Design Rainfalls", Water Resources Research Vol 12, No 6, 1976 (I Cordery Co-Author).

2. "Irrigation with Limited Water Supply", Paper presented at the Darling Downs Institute of Advanced Education Soil and Water Seminar, Toowoomba, May, 1978.

3. "The Viability of On-farm Storages for Augmenting Irrigation", Inst Eng Aust Conference on Agricultural Engineering, Toowoomba, August, 1978.

4. "Optimal InSeason Allocation of Irrigation Water", Inst Eng Aust Conference on Agricultural Engineering, Toowoomba, 1978.

5. “Catchment Time Response”, Project 44/1977, Darling Downs Inst of Advanced Education (now USQ), Toowoomba, 1978.

6. “Bougainville Flood Estimation Manual”, Bougainville Copper Ltd, Rep No ED79/HY01, 1979.

7. “Sizing of Central Pivot Irrigation Systems”, Journal of Agricultural Engineering Society (Australia), 1979.

8. "Some Properties of the Runoff-routing Model", Inst Eng Aust Civil Engineering Transactions, 1980.

9. "Sediment Transport and Hydraulic Sorting in the Jaba River", D.B. Simons Symposium on Erosion and Sedimentation, Fort Collins, Colorado, USA, July 1983.

10. "Tailings Beach Slopes", Mine Tailings Disposal Workshop in conjunction with Mr Paul Williams, University of Queensland, August, 1986.

11. "Development of a Tailings Transport Model", Mine Tailings Disposal Workshop, University of Queensland, 1986.

12. "Rainfall Variability in an Equatorial Environment – Gauge Rainfall", Hydrology and Water Resources Symposium, Christchurch, New Zealand, 28 - 30 November 1989.

13. "Rainfall Variability in an Equatorial Environment – Catchment Rainfall", Hydrology and Water Resources Symposium, Christchurch, New Zealand, 28 - 30 November 1989.

14. "Cyanide Disposal in an Equatorial Environment", Randol Gold Forum, Cairns, Queensland, Australia, 16 - 19 April, 1991.

15. “Small Storages on Large Emphemeral Streams”, International Hydrology & Water Resources Symposium, Perth, 2 – 4 October, 1991.

16. “On the Relationship between Design Flood and Design Rainfall Frequency Curves”, Presentation to Institution of Engineers, Australia (Queensland Division) Water Panel, February 1992.

17. "Areal Reduction Factors for Design Storms", Engineering for Hydrology and Water Resources Conference, Newcastle, June 30 – July 2, 1993.

18. “Incorporating Uncertainty and Risk in Rainfall-Based Flood Estimates”, The University of Qld, Dept of Civil Engineering, Research Report Series, July 1993 (D K Brady co-author).

19. “Incorporating Variability and Uncertainty in Rainfall-Based Flood Estimates”, Australian Civil Engineering Transactions, vol CE36 No 2, June 1994 (D K Brady co-author).

20. “Evaporation and Heat Exchange in Tropical and Equatorial Environments”, Pells Sullivan Meynink Technical Report, 1997.

21. “Modelling Cyanide Decay in Tailings Dams”, Queensland Environmental Conference, Brisbane, 2000.

22. “Cobble Grinding”, Institution of Engineers Australia, Conference on Hydraulics in Civil Engineering, Hobart, 2001.

23. “Hydrologic Routing of Salt and Water”, Institute of Engineers Australia, 20th International Hydrology and Water Resources, Wollongong, 2003.

24. “Second Order Coefficients for Storage Routing”, Australian Journal of Water Resources, Vol 8, No 2, 2004.

25. “Linearity Under the Monoclinical Wave”, Australian Journal of Water Resources, Vol 9, No 2, 2005.

SOFTWARE DEVELOPMENT

TAILDAM – Program computes the transport and deposition pattern (terrestrial and sub aqueous) of tailings in irregular shaped dams, rivers and coastal regions.

GPRM – General Purpose Routing Model. Computes the flow of water and water borne sediment and chemical constituents in complex drainage networks.

EDAPS - Environmental Data Acquisition Processing System. Logger up and down loading; data processing, analysis and presentation.

ROKBKWAT - Computes backwater profiles in rockfill waste dumps.

MEYSED - transport and deposition of silts, sands and mine tailings in natural river systems.