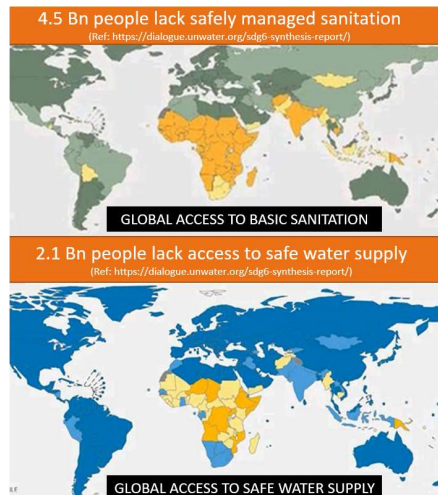
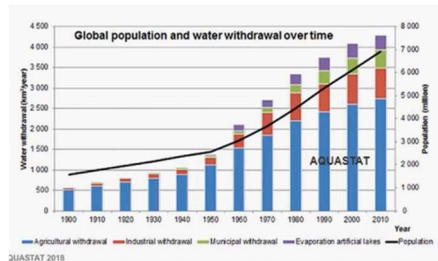


Financing and Investment Analysis – The Role for Private Investment



SDG#6 Water Goal: Cooperation is essential to ensure availability for all. KPIs and performance participation are critical for sustainable management of water and sanitation.



Global Water Withdrawals: Multi-stakeholder partnerships maintain dialogue and governance to secure condition of existing water assets – and not to see them deteriorate over time.



Roger has a good awareness of identifying cost of capital (WACC), minimum return targets and the effects of a slower pace of return recovery for non-recourse financing arrangements. He is aware of other commercial requirements such as compliance with SOX; IFRS; or lender covenant terms

On the global stage, RWconsult Ltd has committed interests with marine conservation and believes it can offer measures that help achieve the UN Sustainable Development Goals (SDG) for providing water supplies and sanitation to all people (SDG#6).

With 80% of countries without sufficient funds to meet increasing costs of Water, Sanitation and Hygiene, RWconsult Ltd believes there is a role for private finance to help meet SDG#6, having previously achieved tariff structures that yield investment returns and maintained equitable prices to consumers, as well as satisfying affordability criteria based on average monthly incomes.

Although the mechanism to sell public assets such as water supply systems is a contentious issue, it is commonly known that low income family not on a water network pay 10-20 times more for water than people connected to a network.

With privately financed services, RWconsult Ltd realises how important it is to set a socially acceptable tariff (e.g. subsidised tariff for low income families) whilst improving customer services through a concession or service agreement. KPI formulae in a supply agreement would help achieve targets for service reliability or GIS-based resolution of customer complaints.

Developing the right commercial conditions for investors, and promoting the key factors to be in place for investment, are factors very familiar to RWconsult Ltd. Roger has worked to ensure clarity of scope, clarity of risks and provision of investor incentives are embedded in the client approach for seeking project financing.

Previously on PPP projects in NE and SE Asia, Roger worked on ensuring legal framework provisions were in place for commercial engagement with investors. He identified risks faced by the project:

- Financial
- Political and Public acceptance of the investment
- Construction
- Operation
- Environmental

He developed strategies to mitigate the impacts of these risks. Investor incentives such as land provision, utility availability or governmental guarantees for revenues would also contribute towards making the investment bankable.

EXPERIENCE PORTFOLIO

Key Projects in East Asia & South-East Asia

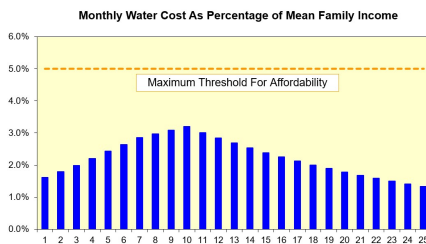
Capital Investment for Outsourced Water Services, Veolia Water – 1997 to 2007



Incheon WwTW, the first BOT in Korea for water, 2002



Water supply facilities for low-income, rural communities in the Philippines



25-year tariff projection compared with Asian Development Bank affordability threshold of 5% of Mean Family Income.



Construction of pile cap and base slab for rapid gravity sand filter unit at Fort Bonifacio, Manila, 1998



Construction of WTP at Fort Bonifacio, Manila, 1998

Roger Williams was assigned to a long-term secondment with Veolia Water for projects related to outsourced services for major industrial companies or public sector clients in the Asia-Pacific region. His role included structuring, negotiating and developing long-term water service contracts. He also devised contract strategies and procurement options applicable for privately financed water supply schemes. Project funds came from equity and local commercial creditors.

In 2007 Roger successfully negotiated one of the largest industrial outsourcing deals in Asia through a JV formed with Bohai Chemicals Group in China (with an index-linked annual turnover of 50M Euros).

Roger achieved other successes with client presentations, bid preparations and design management for various asset acquisitions or mergers (M&A), Build-Operate-Transfer (BOT) projects or similar PPP variants. He was involved in:

- 2 wastewater treatment plants for Incheon City, Korea, the first BOT for water services in the country!
- Technical and commercial due diligence for acquisition of treatment assets or operating businesses for water services managed by large industrial clients in Taiwan or local municipalities in Korea and Philippines
- Review of water tariff structures across the range of income groups in the Philippines for BOT proposals at Lipa City, Silang District and townships in Cavite. These tariff rates were tested by financial modelling to assess the investment returns; end user willingness/ability to pay studies; and the impacts on performance risk to maintain reliable supply
- Water resources development strategies (for groundwater and surface water utilisation) at several locations in the Philippines, including the former US airbase at Clark, Baguio City, bulk supplies to Bulacan, and strategic locations of Luzon, Mindanao and Panay
- Ensure adequate construction procedures in place, to achieve the project requirements and to meet the effluent quality targets as part of an overall investment return

Whilst not directly involved with procedures for grant in aid or developmental funds from EU/WB/ADB donors, the outcomes of these developments directly affected Roger's projects in the Philippines. EU grants for rural water supplies in Mindanao, say, set a benchmark for communal supply arrangements and tariff expectations for BOT water supply projects in southern Luzon.

Thus, investment returns from privately financed projects had to remain competitive against tariff outcomes of multi-laterally funded projects. Furthermore, projects with long term financial returns were sometimes pitched against short term alternatives that utilised soft loans (with conditions) from international governmental agencies (e.g. JICA).

Key Projects in East Asia & South-East Asia

Chemicals Industry: Fee & Contract Negotiation, Tianjin Soda Chemicals, China – 2006 to 2007



Signing Ceremony for Tianjin Soda, Tianjin, 2007



Tianjin Soda manufactured caustic soda and adopted new coal gasification technologies



Presentation of proposals to clients

Roger Williams was the main negotiator for Veolia Water (VW) on a Joint Venture for outsourced Industrial Water and Cooling Water services for Tianjin Soda, a chemicals manufacturer in China and part of Bohai Group. He helped structure the deal, and managed documentation to implement the investment.

The treatment systems comprised cooling water systems; reverse-osmosis (SWRO) desalination systems at a bulk supply point; de-mineralized process water systems; industrial wastewater systems and water re-use systems.

Helping to nurture the relationship over 18 months with the support of his Chinese colleagues, Roger presented various procurement models and corporate structures for this investment opportunity. The cost and revenue lines were defined as separate but integrated systems, which were developed by Roger in a complex CAPEX-OPEX model that interfaced with the main financial model. He managed the financial model outputs and reporting to the VW Executive.

As the primary negotiator, Roger considered the success with this deal as a major milestone. At the time it was understood to be one of the largest industrial outsourcing contracts secured in Asia. Two references of him were made from VW Executives:

"High level professional integrity and diligence in his activities. He brings a wealth of experience gained in many countries and through working with an eclectic mix of cultures." (David Cox, Executive Director, Veolia Water Asia Pacific)

"It has been nice to work with you. I appreciated your team spirit and quality of the job you made." (Régis Calmels, Executive VP of Asia, Veolia Environmental Services)

Steel Industry: Project Financing, ThyssenKrupp-Angang Steel JV (TAGAL), China – 2005 to 2006



Heat exchanger and ultrafiltration units for industrial process water



The opportunity with Thyssen Krupp, in a Joint Venture (JV) with local steel company Angang, helped consolidate Veolia Water's market share in China's outsourcing of industrial water services. The services provided were for cooling water, de-mineralized water (ultrapure) and waste treatment.

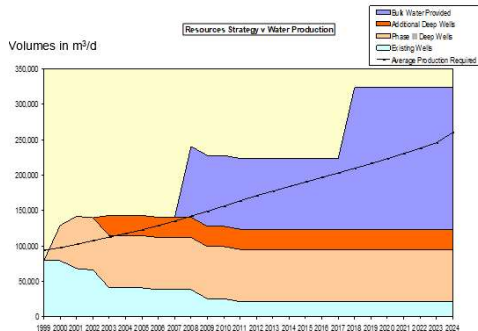
Roger Williams led the technical discussions and commercial negotiations with the board of the JV Company. He managed the financial model outputs and reporting. He also undertook part of the Due Diligence of assets and business operations that were acquired with the investment.

He undertook an operational review of performance and running costs, identifying potential savings or efficiencies. He prepared the EPC Contract preparation for Design & Build of new works and completed the subsequent tender analysis of returned bids by local contractors.

Roger conducted risk management and financial modelling training seminars within the company. He used the TAGAL project as a good example of issues to be addressed for delivering investment in asset acquisitions and new-build, including quantifying risk impacts, contract strategy and identifying targets for investment returns.

Key Projects in East Asia & South-East Asia

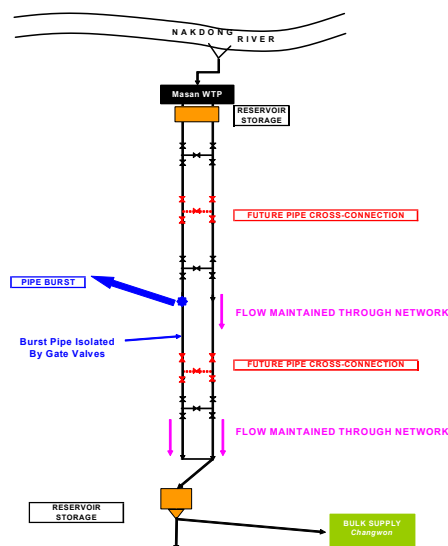
Technical Design Review of Water Supply Systems for Veolia Water – 1997 to 2007



Resource strategy to meet future water demands based on bulk supplies (blue) supplementing groundwater wells



Review of operations and performance at raw water pumping, Yangzi Petrochemicals Company, Nanjing



Simulation of pipe burst along dual transmission main (and contingent storage required) at Masan City, Korea

Roger Williams oversaw design of water supply networks, intakes, groundwater wells, transmission lines across mountainous terrains and local booster pump systems.

- During his work in the Philippines from 1997 to 2000, Roger negotiated BOT water supply agreements, and tackled a variety of water supply schemes tapped from groundwater sources or river intakes. He developed optimised water supply strategies to meet demands over 100 MLD, with associated capital investment for upgrading treatment and network facilities that exceeded 100M USD.
- For the Bulacan Bulk Supply project, north of Manila, the WB-funded Sierra Madre scheme (Angat Dam) was progressing too slowly to meet the short-term water supply needs of communities. Roger was made acutely aware of the constraints from this type of multi-lateral development funding during political discussions held with affected water districts. The BOT proposal he was involved with provided bulk supplies from lateral intakes on the Angat River and from groundwater wells to meet the interim water demands.
- The groundwater resource strategy proposed by Roger for Laguna Water District was formulated from a preliminary examination of the aquifer water balance. The sustainable abstraction solution was compared with estimated recharge rates to the aquifer system. However, he also recommended that a detailed groundwater model study of the aquifer extent should be undertaken to obtain a more accurate picture.
- Roger prepared proposals for reduction of Non Revenue Water (NRW) in existing water supply networks in Kimchon City and Masan City, Korea. The solution to reduce network leakage to a practical level focused on:
 - the creation of network districts (with district meters)
 - the provision of adequate detection (pressure gauges, acoustic correlators, dataloggers)
 - reduced pressure zones (using PRV installations).
- For the NRW study at Masan, problems were compounded by a future risk of a burst in the 18km of 1.3m dual transmission pipe due to the lack of cross connections and contingent storage. The poor chemistry imbalance of treated flows from the Chilseo WTP facility was considered a contributory factor to the leakage due to damage by corrosion, as well as high operating pressures in the network.

Key Projects in East Asia & South-East Asia

Technical Design Review of Water Treatment Facilities for Veolia Water – 1997 to 2007



Operational review of water treatment facility at Yangzi Petrochemical Company, Nanjing, 2007



New lamella settlement (multiflo®) troughs at a water treatment facility in China



Typical groundwater well encountered in Philippines, and poor condition of chlorination equipment



Chilseo WTP, Pusan, Korea: raw water monitoring essential for holistic process management

Roger Williams managed technical process and operational performance reviews of water treatment plants. These were part of a due diligence to acquire assets or to identify potential risks from investing in an existing water business entity. The projects ranged from industrial complexes in China; city water supplies in Korea, to local facilities in Philippines and Taiwan.

Projects included:

- Operational review for Tze Tan Water Treatment Plant – Sludge De-watering plant in Taipei, comprising 28m thickeners (2% solids) and filter presses. Cake was good quality, despite there being no sludge conditioning permitted due to ban on polymer use
- Review of water resource development in Laguna Bay, near Manila for potential sources as bulk supply to adjacent projects managed by Veolia Water. This also considered an initial concept design for settlement and RO desalination based on maximum admissible raw water parameters in Laguna Bay
- Design overview for an intake and water treatment plant along the Panay River, supplying 19 MLD of potable water to Roxas City, Philippines. Treatment stages included coagulation/flocculation, settlement, rapid gravity filters, pH balancing and disinfection
- Concept proposals for new groundwater wellfield at Bustos, Bulacan, including radial collectors (ranney wells) for water infiltration from river basin
- Groundwater supply proposals for PPP offers to local water districts in Philippines: at Roxas City in Panay; Cavite in Luzon; and Cagayan de Oro in Mindanao. Deep wells yielded production rates between 2 MLD and 9 MLD. The project at Cagayan de Oro also involved bulk water supply from River Bubunawan in the adjacent province of Bukidnon
- Roger managed the technical review and operational performance of the 400 MLD Chilseo WTP supplying water to Masan City, west of Pusan in Korea. This facility comprised traditional processes supplemented with pre-/post-ozonation and activated carbon filters

For the large treatment facility at Chilseo WTP, turbidity control and settlement were critical for effective disinfection, such that microorganisms would not attach themselves to suspended particles. Disinfection by overdosing with ozone and chlorine was typical for dealing with unknown pollution risks, with the ozone dosage fixed regardless of incoming raw water quality.

The problems with ozone generation included inadequate control of ozone residual and high dosage due to an oversized unit. Poor working practice and emergency procedures were identified, particularly if excess ozone was released to the atmosphere, or following water quality incidents.

Key Projects in East Asia & South-East Asia

Technical Design Review of Wastewater Treatment Facilities for Veolia Water – 1997 to 2007



Operational review of a WwTP in Korea, based on analysis of existing controls and process data, 2002



Operational review for Chung Shing Brewery, Taichung, Taiwan 2000



Operational review of industrial wastewater plant at Yangzi Petrochemicals Company, Nanjing, 2007



Janglim WwTW, Pusan City, Korea – A typical facility reviewed for its operational performance, 2002



Su Tze Tou pumping assets in Taipei assessed for taking over existing operations contracts, 2000

As part of a potential offer for outsourcing of wastewater services or for a BOT proposal or asset acquisition, Roger Williams was handed responsibility by Veolia Water to assess the performance at existing wastewater treatment plants.

These plants were managed by industrial clients such as pulp and paper mills or chemical industries; or operated by local municipalities in Korea, Philippines and Taiwan. The wastewater treatment facilities were neglected at worse, but generally in need of investment as they were in a poor condition.

General observations and analysis from the existing operations revealed the need for better power utilisation, particularly for aerated systems (traditional activated sludge process) and the sludge management balance regarding the degree of return of activated sludge.

- Excessive costs were spent on an inefficient biological process that was controlled by incoming pollution loadings rather than dissolved oxygen levels in tanks.
- The aeration tanks received very high polluting loads from excess sludge not handled at sludge treatment stage were redirected to the aeration tanks, thus imposing a significant impact on the treatment capacity of the aeration stage.

The other common fault lay with the lack of a maintenance regime applied by the plant management:

- Reactive maintenance only and insufficient monitoring points and data analysis
- By adopting a more preventative approach to maintenance, existing staff could be trained to undertake these repairs
- In this way, costs would be reduced and the output from staff would be greatly enhanced

The typical procedure for assessing the existing operations of wastewater treatment facilities would include the steps below:

- Following his inspection of the condition and function of the equipment, Roger would collect relevant operating data for subsequent analysis
- He worked with his teams to develop strategies for any operational savings, opportunities for improved practices and to evolve technical solutions for the supply of wastewater services
- The capital costs and operational costs would then be assembled by Roger as a CAPEX-OPEX model, which then interfaced with the financial modelling to calculate projected investment returns
- This culminated into the commercial offer to clients, which Roger presented and negotiated a final offer.

Desalination Systems & Membrane Filtration for Industrial Water

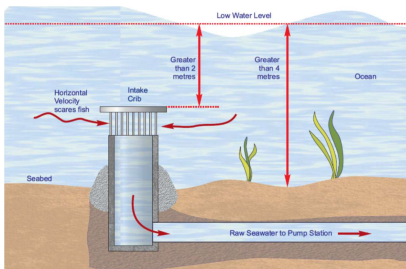
Technical Design Review of Reverse Osmosis/Membrane Systems – 2004 to 2007 and 2012



Membrane (Ultra-filtration, Reverse Osmosis) Systems for De-Mineralized Water & Industrial Water



Nanofiltration membrane trains as part of industrial water process for micro-electronics industry



Simulation of flushing in the Red Sea indicated that intake point and outlet canal (via DRI steel plant) at the KAEC desalination plant to be 300m apart



Roger Williams' experience in Asia providing outsourced services to petrochemical and micro-electronic industries for ultra-pure water involved design and installation of membrane technologies (and mixed bed filters) up to 30 MLD capacity.

Clients included: Hynix Semiconductors, Wuxi, China; Nanjing Chemicals, Nanjing, China; Sinopec, Yangshan Plant, Beijing, China; and Yangzi Petrochemical Company (YPC), Nanjing, China

A potential offer may include acquisition of existing plant as well as construction of new facilities. Roger would be involved in the assessment of existing demineralised water treatment assets.

He worked with his teams to develop strategies for any operational savings, opportunities for improved practices and to evolve technical solutions for the supply of water services.

The capital costs and operational costs would then be assembled by Roger as a CAPEX-OPEX model, which then interfaced with the financial modelling to calculate projected investment returns. This culminated into the commercial offer to clients, which Roger presented and negotiated a final offer.

In preparation for Roger's successful negotiation of one of the largest industrial outsourcing deals in Asia during 2007, he was part of the discussions to secure a water supply to Bohai Chemicals' LinGang Industrial Park in Tianjin. This involved Roger's assistance in liaising with the Tianjin Dagang Desalination Facility (100 MLD), and in reviewing the terms of the supply agreement for industrial water.

For other specific desalination plant projects in Asia, Roger developed planning strategies for design, procurement & material management and construction management.

- he reviewed investment risks in 2006 for a large SWRO desalination plant to supply a petrochemical park at Dalian, China for the Dalian Shide petrochemical company. This involved developing a technical position on the viability for pre-treatment options and RO systems.
- He helped establish operating regimes for appropriate staffing or training needs, and develop operational procedures, documentation, and safety or environmental control measures.

Conversant with the complex commercial dynamics for water treatment investments, Roger provided the right advice in 2012 to Emaar for their mega-project at King Abdullah Economic City (KAEC), on the Red Sea, Saudi Arabia.

- Emaar was responsible for developing the new city's water supplies. Roger was the overall infrastructure lead for the 700ha industrial zone of KAEC (comprising a desalination plant, the 20M TEU port, DRI steel plant and power plant).
- He provided key advice to Emaar on planning for the future 100 MLD desalination plant (ph 1), including raw water analysis, permit needs and treatment process options. He identified constructability options for the intake and outfall works, based on varying skills of local contractors.