



Paul Collier

## Editorial

Welcome to this edition of Beca's Watermark.

While providing professional services is a constantly evolving process, there are three consistent elements behind the drive for continuous improvement.

The exemplary service provider should:

- Be easy to do business with
- Understand their client's needs
- Be proactive in adding value

In this issue we showcase some selected projects that reflect these business drivers through the provision of smart and innovative solutions to technical challenges. We also introduce some new services that will assist our clients and partners to improve business performance. Although the featured projects have a common theme around rainfall independence, they are at opposite ends of the spectrum in terms of scale.

The Merrifield Stormwater Treatment Plant being designed for Yarra Valley Water is a new concept in water supply, harvesting the run-off from an urban industrial site before storing and treating it to drinking water quality standards. At the other end of the scale, the Victorian Desalination Project

is, to date, the largest Public Private Partnership (PPP) project undertaken in Victoria which, at its peak, saw more than 250 Beca staff involved in the design phase.

These projects reflect how we need to adapt our approach to water supply to reflect the pressures of population and industrial growth, variability of supply and the move away from the use of restrictions to manage demand. This integrated water management approach reflects the industry's commitment to working smarter and to get more from less out of this scarce resource.

Lean Six Sigma is a business improvement tool that has been practiced by the manufacturing sector for a number of years. More recently we have been able to assist clients in the infrastructure sector (in particular water and power) to build on their existing capabilities with significant improvements in business performance. The outputs from the process can be summarised as "being able to do more with less" which enables existing resources to be better utilised within the business.

We hope that you will enjoy reading our latest newsletter.

### Editorial

Merrifield Project for Yarra Valley Water

Smart collaboration to treat Melbourne's sewage

Working on Victoria's largest Public Private Partnership

Lean Six Sigma assists clients achieve their sustainability goals

People News



Artist's Impression  
Source: Merrifield Corporation Pty. Ltd.

## Merrifield Project for Yarra Valley Water

Yarra Valley Water's Merrifield Stormwater Treatment Plant is designed to harvest stormwater runoff from an industrial estate and treat it to drinking water quality. It is an innovative project which represents a milestone in water resources management, public health engineering and sustainable community development in Australia.

Water supplies are traditionally drawn from catchments with little human activity. This minimises the risks, and minimises the concentrations of contaminants that can affect health, thus reducing treatment requirements. Recycling of wastewater for non-potable uses is relatively commonplace in Australia and other 'water poor' parts of the world. However, other solutions are required to supplement drinking water supplies.

Stormwater has long been considered a waste rather than a resource. The primary

objective of the Merrifield Stormwater Project is to demonstrate that decentralised harvesting and treatment of urban stormwater to drinking water quality standards is a safe, reliable, and cost-effective means of supplementing large metropolitan water supplies.

The Project will harvest the run-off from land developed for urban industrial use, storing the water through wetlands and an aerated 65 ML storage basin prior to extraction for treatment in a dedicated water treatment plant. The proposed treatment train comprises screening, DAFF, UF (with RO as an option), advanced oxidation, GAC, chlorination and fluoridation.

The project is currently at the design stage, and it is scheduled for completion in 2012. Once complete, it is designed to produce 1.0 ML of water per day. Beca's

design team is working collaboratively with Yarra Valley Water and stakeholders to achieve the Department of Health and Environmental Protection Authority (EPA) approvals. Beca is providing comprehensive engineering design and planning services.

The project was recognised for its approach to sustainability, winning the 'Master-planning and design' category of the 2009 Stormwater Excellence Awards.

"This project demonstrates an innovative approach to solving common urban water issues and to thinking differently about the best way to manage water resources in a country subject to drought and climate change," says Mr Sam Austin, Yarra Valley Water General Manager Sustainable Development.

## Smart collaboration to treat Melbourne's sewage



One of the larger and more complex projects being delivered by the Water Resources Alliance (WRA) for Melbourne Water (MW) is the Grit and Screenings upgrade project. The project involved the detailed design and construction of a new \$45M inlet works at the Eastern Treatment Plant (ETP), which treats 40% of Melbourne's sewage.

The new facility has 5mm aperture screens, with high energy washing and dewatering of the screenings to make the grit suitable for reuse.

The complex multidisciplinary project required close collaboration between the design team and the delivery team as well as the plant asset, operations

and maintenance teams in the alliance environment.

The structural, mechanical and architectural 3D drafting packages were integrated to develop a complete model of the works. The model was used to "walk through" during operability and maintainability review workshops with plant staff. The model also enabled the design team to avoid clashes between pipework, structure, electrical and mechanical equipment.

As the Grit and Screenings Upgrade project had a number of challenges and a number of significant risks, there was a major focus on innovation by all team members to address these challenges and mitigate the risks.

"I have been very impressed by the innovative solutions developed by the project team. Eliminating the risk of flooding the local high voltage switchroom and avoiding the need to put extra load on the (38 year old) suspended concrete channels transporting raw sewage were great outcomes that significantly improve our operational security."

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Charmaine Quick  
Melbourne Water Manager Eastern Treatment Plant

Technical Director Allan Campbell explains: 'We ran training sessions for the design team on the use of innovative techniques on the project. We also conducted a 'Challenge Review' as part of the functional design, this involved an independent team of experts conducting a "cold eyes" review of the project by means of an intensive one day workshop. As a result of this change in approach, we identified 26 innovations, of which 20 were adopted'.

## Working on Victoria's largest Public Private Partnership

Stephanie Hastings, a first year graduate in Beca's Australian Water team, gives us an insight into life on site at the Victorian Desalination Project.

### What is your role on the project?

This is the second time I have worked on the project. My initial role was working in the Melbourne design office as a mechanical engineer, primarily on the reverse osmosis (RO) building. When the opportunity arose to be based on site, I jumped at it. I am now working with the RO mechanical team as a site engineer.

### This being your first site based role, what were your first impressions?

When I initially arrived on site I was amazed at the sheer size of the project, there are over 3000 site based employees!

Being site based has given me an understanding of the challenges faced on large projects, from dealing with faulty equipment to dealing with other contractors on site.

It has been really interesting to see Safety Inductions and Risk Assessments in practice. It has really given me a different appreciation for the systems and processes while working on a large project. You don't get to learn the impacts when you're working in the office.



### Have you enjoyed living on site?

I am really enjoying living away from home. It takes me 10 minutes to drive to work along the Bunurong Coastal Drive. I regularly have lunch with a group of young engineers from across the project and we organise activities outside of work to catch up and interact. It's been a great way to get to meet others working on other sections of the project.

### Any highlights, challenges or difficult moments during the project?

Yes! It is always a challenge dealing with a multi-disciplinary team – engineering,

“Working on site makes me proud of my involvement on such a large scale projects. I feel like I'm really making a difference”.

construction, safety, quality, environmental and the IR&EA. I work more hours than in the Beca office, so that was tricky to adjust to at first. I am finding the work both challenging and rewarding, and I am learning new things on a daily basis - I am really enjoying it down here!

## Lean Six Sigma assists clients achieve their sustainability goals

Internationally, the manufacturing sector has used Lean Six Sigma as a business improvement tool over many years. Beca has worked with a range of clients in New Zealand and Australia to build on their existing capabilities, helping to implement a number of improvements to their businesses.

In 2008, Auckland Airport sought to enhance the passenger experience by applying Lean Six Sigma as its process improvement methodology. Beca facilitated a two year airport-wide programme which aimed to address all aspects of the customer experience. As a result, Auckland Airport is now rated among the top ten International Airports for its positive customer experience.

Lean Six Sigma can assist the Water Sector in a range of applications:

- Examining current initiatives in the business to ensure that they are aligned with the overall strategic priorities; and also helping to shape these priorities
- Putting a stringent framework in place around development of opportunities and helping to prioritise these opportunities (ie making sure efforts are not wasted on opportunities that will give little or no return)
- Identifying whether any strategic initiative going forward is in line with continuous improvement strategy, thus enabling better business and risk management.
- Helping to manage the risk process through the implementation of a single Governance structure for any new company initiatives.

Lean Six Sigma can also assist with meeting the business sustainability targets by eliminating waste from processes. As companies work to become more environmentally sustainable, clients are finding that the tangible benefits are hard to calculate, creating a potential conflict between sustainability goals and more traditional objectives of profitability and efficiency.

By applying Lean Six Sigma to include sustainability goals, companies are able to merge the critical goals of being good 'corporate citizens' and improving their bottom line.

For more information contact Eva Wintersberger on +61 449 161 641.



## People News

### Garry Macdonald

Garry Macdonald, Beca's Water Market Segment Leader, has been appointed to the Water Environment Federation (WEF) Board of Trustees by new WEF President Matt Bond for a three-year term. WEF members include experts in environmental engineering, industrial wastewater treatment, sewerage treatment, stormwater management, water quality analysis and planning and related disciplines. Garry becomes the first New Zealander ever on the Board, joining three other new members, nine existing members and six Officers responsible for governing WEF.

Garry has worked for several Australian clients, most recently the Victorian Desalination Project.



## Beca Water team value adds with recent appointments

Beca's Australian water team is pleased to have new Sustainability and Air Quality expertise on board with the appointment of Jo Cain as Business Director – Sustainability and Tracy Freeman Technical Director – Environmental Engineering.

### Jo Cain

As Business Director – Sustainability, Jo brings more than 22 years' experience to Beca. She has a wealth of experience working with ASX listed companies, in particular mining and power organisations, with clients such as Newcrest, BHP Billiton, Rio Tinto, MMG and Nyrstar in the mining sector, and Origin Energy and TRUenergy in the power sector.



Jo specialises in sustainability report development and assurance, sustainability strategy, carbon strategy and auditing, and strategic audit programs encompassing risk, liability, assurance, performance and compliance.

In her new role Jo leads the sustainability business, as well as focussing on integrating sustainability and carbon services into Beca's wider range of services.

Jo is Chair of the Banksia Environmental Foundation, and a Board Member of the Australasian Reporting Awards (ARA).

**"There are two sides to further developing a sustainability business at Beca: new services in the form of sustainability reporting and carbon/greenhouse accounting and reporting, and continuing to integrate sustainability into our engineering bids and project delivery, differentiating Beca by adding value for our clients".**

### Tracy Freeman

Tracy Freeman, Technical Director - Environmental Engineering, has recently joined Beca's Australian Water team. Tracy has 19 years' experience in air quality consultation and is widely recognised as an expert in air quality issues. Tracy specialises in air quality and



**"We aim to provide a 'one-stop-shop' for our clients, helping them to meet a range of needs including approvals, ambient monitoring, latest technology air quality modeling and meteorological services."**

meteorological monitoring, estimating air emissions, dispersion modelling, environmental impact statements and the assessment of mitigation options to improve air quality.

Tracy has conducted training courses in dispersion modeling for Clean Air Society for Australia and New Zealand (CASANZ), and also chairs the Odour Special Interest group of CASANZ. In the Water area, she has provided advice on odour and combustion emissions for a large number of WWTPs (both municipal and industrial), and solid waste management facilities.

During the course of her career Tracy has provided air quality advice for a broad range of industries, infrastructure activities, and fuel-burning units.



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