



The 20TH ANNIVERSARY OF SYDNEY'S DEEPWATER OCEAN OUTFALLS

by Robert Peters – Business support advisor, Sydney Water

The 14 August 2011 marked the 20th anniversary of the completion of Sydney Water Corporation's Deepwater Ocean Outfall (DOO) Project, which included construction of DOOs at North Head, Bondi and Malabar Wastewater Treatment Plants (WWTP).

The project began in October 1984 and was specifically designed to safely dilute and disperse into the ocean a large portion of Sydney's treated wastewater. The aim was to reduce environmental impact and protect Sydney's beaches (see Images 1 & 2).



Image 1 - Malabar - Offshore - Pre Outfall - Visible Effluent Plume



Image 2 - Malabar - Offshore - Post Outfall



Image 3 - Sedco 600 Oil Drilling Rig

The total cost to investigate, design, construct and commission the three Deepwater Ocean Outfalls was \$310 Million. To meet the deadline of 1991 for completion of the total project, work continued simultaneously on all three ocean outfalls, often 24 hours a day. Construction involved a unique combination of tunnelling and offshore engineering technologies, the latter being adapted from similar technologies developed in the offshore oil and gas industry (see Image 3). At the time, the hydraulic design of the Sydney Outfalls represented the leading edge of development for high dilution, self-cleansing and essentially maintenance free outfall facilities. The design has since been adopted for other major overseas outfalls, including Boston USA.

Each of the three deepwater submarine outfalls essentially consisted of a main tunnel constructed from a point beneath the treatment plants (see Image 4) and extending for a distance of up to 3 km offshore (see images 5 & 6 overleaf).

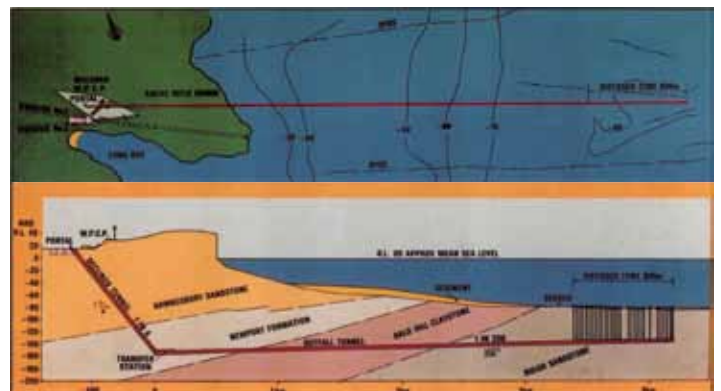


Image 4 - Cross Section of Malabar Outfall

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Image 5 - Tunnel Boring Machine



Image 8 - Offset Vertical Riser



Image 6 - Sydney Water Board Employee - Graham Dixon - Standing in Main Tunnel

The minimum rock cover at the offshore end of the tunnel was 45 metres with a water depth of up to 80 metres. Treated wastewater is discharged into the ocean via vertical riser shafts which are offset 12 metres from the main tunnel (see Images 7, 8 & 9). Each fibreglass riser, which is encased in concrete, is connected to a

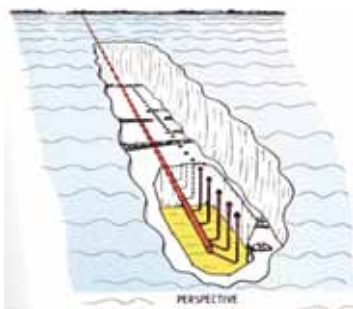


Image 7 - Malabar - Offset Vertical Risers

fibreglass diffuser head. Large steel caissons, some 3 metres in diameter at Malabar, protect the 8 port diffuser head from ship's anchors (see Image 10).

The diffusers release effluent into deep water which combined with ocean currents ensures adequate dilution. Salt water, sunlight, and wave action assist in breaking down and disinfecting the treated wastewater. Each outfall is designed to uniformly discharge the effluent into the ocean along a 500-800 metre diffuser zone, 2.2 - 3.7kms from the shoreline.

The former Environmental Protection Authority (EPA) in its final commissioning report (1995) on the impacts of the ocean outfalls, stated that environmental monitoring had indicated few detectable effects on the

overall diversity of marine plants and animals. The report also identified that after the commissioning of the ocean outfalls, levels of visible wastewater on Sydney's beaches had decreased considerably.

The Department of Environment, Climate Change and Water (DECCW) requires Sydney Water to annually monitor and report the condition of the marine environment around the ocean outfalls (with ocean sea bed sediment samples taken as far north as Long Reef and Marley Beach to the south). During recent inspections this year all caissons sighted, using a remote controlled/operated undersea vehicle (ROV) fitted with



Image 9 - Sydney Water Board Employee - Graham Dixon - Crouching under Vertical Riser Shaft

closed circuit television (CCTV) equipment, were found to be surrounded by abundant marine life including sea urchins, anemones and schools of fish. During the most recent sea trip to Malabar DOO, for maintenance activity, a large pod of dolphins was sighted on the surface directly above the outfall.



Image 10 - Protective Steel Caissons - Some with Sacrificial Anodes Attached

Editors Comments

Karen Eaton



Welcome to the August edition of NEWSdrop. I hope you are enjoying the first signs of spring and looking forward to warmer days ahead.

In this edition we have our President's first bit from incoming NSW branch President Murray Thompson, whom we officially welcomed at the recent "Heads of Water" function in Sydney. Murray has provided a good summary of Heads of Water in his President's bit and great photos are also included. Feedback indicates the night was a resounding success for all members in attendance, so be sure to include it in your plans for 2012.

Our lead story marks the 20th anniversary of Sydney's Deepwater Ocean Outfalls, which are critical and remarkable components of our capital city's

infrastructure. The function of the ocean outfalls and how they came about can be easily taken for granted, however the impact they have on Sydney's environment and community is particularly significant. The story and photos in this edition seek to highlight the extensive engineering effort that went into delivering the Deepwater Ocean Outfall project finalising in August 1991.

Also included in this edition is an outline of Shoalhaven Water's Tapstar Water Education Show, bringing water awareness to primary school children, not only in the Shoalhaven region, but across the country. Our current Grab Sample is with Sally Rewell, who has recently taken over as the Chair of the NSW Young Water Professionals (YWP). Sally has also included a summary of the recent YWP mentoring breakfast in this edition.

I encourage those interested to participate in the YWP network. The YWPs are always keen to greet new members, and it's a great way to get involved in a wide range of areas within the water industry. Please visit the AWA website for more information.

I hope you enjoy this edition of NEWSdrop. All contributions for future editions are welcome, and can be emailed to me at karen.eaton@ugllimited.com.

Presidents Bit - August 2011

Murray Thompson



Hello from Port Macquarie to all our NSW AWA members. As this is my first "President's Bit", I would firstly like to recognise the tremendous work done by Cheryl Marvell and the past NSW Committee over the last two years. The range of activities and events, both in the metro and regional areas, has certainly provided great value and interest to the water industry in NSW. This work has also been well supported with the co-

operation and assistance of our very active Young Water Professionals.

Cheryl's proven ability to mentor and encourage others to work to their full potential, plus work tirelessly herself, has provided many good outcomes to the AWA membership and the water industry during her period as NSW Branch President.

I'm extremely fortunate that Cheryl is remaining on the NSW Branch Committee, together with a number of others. They will provide advice, guidance and ensure we continue to meet the growing needs of our membership, and address the many water resource issues currently facing NSW and the broader national water reform agenda.

The new committee will also continue to be well serviced by our dynamic NSW Branch Manager Despina Hasapis, who has already told me not to

muck it up, now that she has it all running so smoothly! So Despina I will try hard and Cheryl has left some big footprints for me to follow.

Elsewhere in this edition of NEWSdrop we introduce the new committee, which includes: a good cross section of youth and more mature members, from both the private and public sectors; a member of the NSW Water Directorate Committee; and both regional and metro members. I'm looking forward to working with the committee and our first planning day is scheduled for 21 September 2011. Any input from other members would be much appreciated.

I would like to highlight our new Vice President Erin Cini, who has been involved in a number of significant projects with the National Water Commission.

Our new NEWSdrop editor is Karen Eaton, who will be seeking your input for forthcoming NEWSdrop editions and would like to receive at least one regional article for each edition. Thank you to new committee member Carmel Krogh for her regional contribution in this edition, and I would also encourage others to assist Karen in this regard.

For those of you who were able to attend the recent "Heads of Water" dinner held in Sydney, I think all would agree that the new venue at the Convention Centre worked extremely well for this event, allowing everyone more space and amenity to move around and network throughout the evening. A very big thank you to the evening's sponsors Abigroup Water and BECA, and to Cheryl, the past committee, and Despina for organising and delivering such a good evening. Abigroup Water have indicated they will again sponsor this event in 2012, which is very much appreciated.

Thank you also to Aquatec-Maxcon for their ongoing sponsorship of a table at the "Heads of Water" dinner for attendance by members of the Young Water Professional group.

The evening's MC was again Mr Tommy Dean, who returned from 2010, more eager than ever to ensure that this "A" – "WAA" event, as he has now christened it, was enjoyed by all, and to also renew his relationship with our CEO Tom "Molotov" Mollenkorp. I'm not sure if Tom was as keen as Tommy on this one. We were also fortunate to have our new National AWA President Lucia Cade in attendance, which was a good opportunity for NSW members to catch up with her during the evening.

Guest speaker on the night, The Minister for Primary Industries and Small Business The Hon. Katrina Hodgkinson MP, outlined her approach to the expanded portfolio of Primary Industries which now brings together Agriculture, Fisheries, Catchment Management Authorities, Marine Parks, Office of Water, State Water Corporation, NSW Food Authority and Sydney Catchment Authority.

The Minister recognised the role of AWA representing leaders and managers in the water industry, encouraging our continued expert input and involvement in all things water. Current priorities for the Government in the water sector would appear to include: completion of all Water Sharing Plans by 2013; expansion of the NSW Water Trading System; a new Aquifer Interference Regulation and Policy particularly related to mining and coal seam gas exploration; the Murray-Darling Basin Plan; and Infrastructure investment. The NSW Office of Water will provide a report upon the recommendations of the NSW Regional Local Water Utility Inquiry.

The Minister's Chief of Staff, Mr Tim Scott also attended the dinner, expressing an interest to find out more about AWA and waterAustralia. This

opportunity is currently being pursued to establish good linkages with the new Government.

The Minister made a number of references to the Government's "triple bottom line approach to policy". Our MC Tommy Dean was intrigued, asking the audience, how there could be three bottom lines, and surely there can only be one line on the bottom. This does raise a really good point about how we communicate with the general public - often our language and acronyms need to be modified to ensure the message is received and understood. Tommy did an excellent job entertaining us throughout the evening, providing some great examples of why gun laws are better in Australia than in his home country of the USA.

Nominations for the 2011 NSW Water Industry Awards have now been opened, with submissions closing on 31 October 2011. So please spend some time to reflect upon what your organisation and its staff have achieved collectively or individually and submit a nomination to recognise projects, individuals and celebrate important advancements in our industry. Many thanks to our awards' sponsor Sydney Water and full details are available on the NSW AWA Branch website. These awards will be announced at the NSW Awards Dinner to be held in February 2012.

Finally, from a regional perspective, the 14th NSW Regional Engineers & Operators Conference will be held in Byron Bay on 24 to 26 October 2011. Final programme details will be released very shortly and I look forward to seeing many of you at this event on the beautiful Far North Coast of NSW.

Shoalhaven Water – Expanding the education message to the youngest customers

by Carmel Krogh – Director, Shoalhaven Water

Shoalhaven Water, the Local Water Utility business unit of Shoalhaven City Council, developed the Tapstar Water Education Show in 2006 specifically for primary school age children. The show is performed by professional actors under contract from the Eaton Gorge Theatre Company. The show is an



interactive play directed at children from kindy to year 6, dealing with the important issues of water conservation, water quality and wastewater, in a fun, interactive and entertaining way.

The play is supported by teacher and educational resources developed to achieve syllabus outcomes.

Although originally developed to promote sustainable



water conservation practices and water demand management throughout the Shoalhaven, the goals of the program have expanded in both its message and geographical reach. Since 2008 the show has been taken to such places as Brisbane, Darwin and regional Victoria. Most recently, the Tapstar message was delivered as part of the SA Water Brain Wave 2011 program at the SA Water Learning Centre in Adelaide.

The Tapstar message has recently moved beyond the initial water conservation and demand management focus, and has sought to deliver the basic elements of wastewater sustainability through the inclusion of a new play targeting the discharge of inappropriate wastes into the sewerage systems.

Shoalhaven Water's Business Manager, Tony Holmes, can be contacted on (02) 4429 3226 for information regarding Tapstar's services.

Young Water Professionals mentoring breakfast

by SALLY REWELL
- Chair, NSW Young Water Professionals

On a chilly morning on August 16, the NSW Young Water Professionals (YWPs) held another fantastic mentoring breakfast at Lend Lease. There was a great mix of first time and returning mentor pairs to the breakfast this year. While enjoying a hot breakfast with eggs cooked to style, delegates had the opportunity to meet and mingle with other water professionals from different companies.

The NSW YWP Mentoring Program has been running for a number of years, and gives an opportunity for professionals in the water industry with more than 10 years experience to share knowledge and career advice with young professionals in the early stages of their career. The relationship can help strengthen confidence and performance of the mentees, by helping them to reach their goals, and can lead to personal growth for both mentor and mentee.

This year eager first timers to the program were wondering what the morning would hold. The event was facilitated by our very own Cheryl Marvell, Acting Manager for Stormwater at Sydney Water, and past



President of the NSW AWA Branch. This year's breakfast built on the successes of last year. Mentor and mentee pairs were matched based on a number of factors, including specialities and experience. Cheryl helped break the ice for the pairs and ran through a number of exercises to help them get to know each other. The event then concluded with pairs discussing the importance of the mentoring agreement and action sheet – vital tools to get the most out of the relationship.

Special thanks go to Despina Hasapis, AWA Branch Manager and Cheryl Marvell, Event Facilitator. Thanks also to the NSW YWP Volunteers for their help on the day and **Lend Lease** for their continued sponsorship of YWP Events.



Getting to know...



Grab Sample – Sally Rewell



Sally Rewell is a graduate chemical engineer at Rouse Hill Water Recycling Plant, Sydney Water. Sally is also the incoming Chair of the NSW AWA Young Water Professionals.

Most vivid childhood memory involving water?
Days playing in the sand and surf at my beach house.

What was your first job and how did you get it?
Delivering pamphlets for the local real estate agent, because we lived next door to the licensee.

Favourite part of your job?
The outdoors.

Worst part of your job?
Cold winter mornings collecting samples.

Most boring job you've ever had?
Delivering pamphlets.

Most bizarre job you've ever had?
Ball girl at the NSW Open Tennis.

Pastimes / hobbies?
Skiing.

What's the riskiest thing you've ever done?
Sky diving.

Your ideal weekend consists of?
A hot summer's day lying in the pool on a lilo.

What are you currently reading?
The Girl Who Played with Fire (I know I'm behind, don't tell me what happens).

Favourite food?
Macarons... I'm currently trying to perfect baking them.

Favourite music?
Guns and Roses – November Rain; U2 – With or without you.

Favourite film?
Terminator 2.

How much value does community participation add to our industry?
Huge – without a community or customer, there wouldn't really be an industry.

Best advice you've ever been given?
Property is the best investment.

What is one thing that not many people would know about you?
I have a small scar on my right temple I got when I was three. My brother and cousin were building a cubby and I got in the way. I'm very lucky to be alive and still have vision in my right eye.

Interview compiled by Leonie Huxedurp

Introducing the new NSW Branch Committee

Front Row:

Erin Cini- NSW Branch Vice President, Murray Thompson – Branch President, Cheryl Marvell

Next Row:

Justin Watts – CH2M Hill, Tim Summers – AECOM, Ian Chase-Beca, Paul Macinante – SKM, Carmel Krogh – Shoalhaven Council, Despina Hasapis,

Back Row:

Tony Cartwright – Sydney Water, Katherine Marshall – Beca, Ivan Reolon – Aquatec-Maxcon, Karen Eaton – UGL Infrastructure, Paul Freeman-Sydney Water, Mark Trembath – ITT Water & Wastewater, Kate Miles – AECOM, Emma Pryor – MWH



NSW Heads of Water Gala Dinner 2011



Thank you to our sponsors Beca Pty Ltd and Abigroup Water

