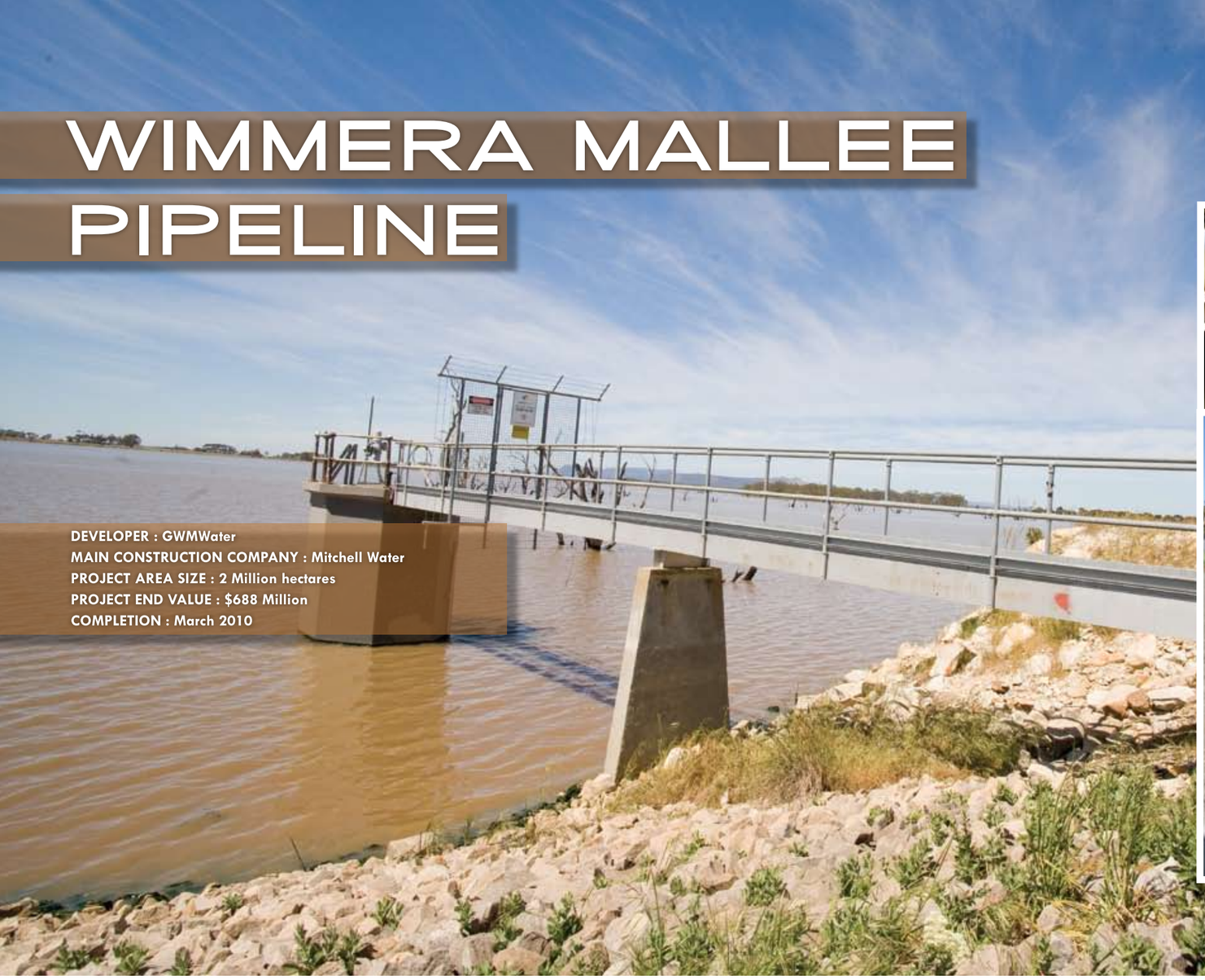
WIMMERA MALLEE PIPELINE



DEVELOPER : GWMWater
MAIN CONSTRUCTION COMPANY : Mitchell Water
PROJECT AREA SIZE : 2 Million hectares
PROJECT END VALUE : $688 Million
COMPLETION : March 2010

A DROUGHT-BREAKING DEVELOPMENT

Australia's largest water infrastructure project, the Wimmera Mallee Pipeline, is a shining example of how community, industry and government can pull together to improve prospects for the future. It is also an extraordinary construction feat: 8,800km of pressurised pipelines spread over two million hectares of agricultural country, delivering water to 9,000 rural properties and 36 towns. It replaces 18,000 km of open earthen channels.

The feasibility study for the WMP was carried out in 2001, and construction was planned to take a decade. This was compressed into five years and then achieved in three, due to the critical situation of water supplies.

Jo Bourke, Project Liaison Officer for GWMWater, the regional water authority who managed and delivered the project, said there were minutes from local town meetings calling for a piped water system as far back as 1928. "The losses of water from the earthen channel system were a huge waste," she said. "The drought forced a positive change in fast-tracking the project."

The $688 million cost of constructing the system was shared between federal, State and the regional community. Landowners contributed by funding the cost of their own on-farm infrastructure of pipes and water storages, with many receiving a state rebate as part of drought assistance. GWMWater's contribution is generated from the annual tariff, which was changed from historic dam fees to a metered volumetric tariff. Enormous effort and skill were also required.

"We set up a separate business unit staffed by up to seventy people. As we went through each tender and construction phase, we brought in specialists as required to build the capacity of our organisation," said Jo.

"As we completed each supply system, water was made available to customers. We supplied water before construction was completed due to the drought and limited water supplies. It saved the huge cost of carting water, particularly with the distances involved. "The majority of water in our system is sourced from the Grampians. The Grampians storages have been as low as 3.5 percent capacity. "The pipeline will massively improve water quality, there were problems with salinity and turbidity in the channel system. 'The support we've had from landowners has been outstanding. Unlike some other projects where there are winners and losers, everyone wins with this project."

GWM Water employed local indigenous monitors for the construction process as part of its Cultural Heritage Management Plan. The Cultural Heritage Assessment carried out prior to starting works had identified sites and existing Native Title Areas. "It's been great employment and training for the local indigenous people," said Jo. "We have employed up to 13 indigenous people at any one time, and there is an ongoing work opportunity for them. The WMP is a real triple bottom line project."

Mitchell Water Australia were the company charged with the design and construct task for six of the seven separate supply systems comprising the WMP. Up to 200 of their staff worked on the project. As Australia's largest dedicated water pipeline contractor, they specialise in the design, procurement and construction of cross country water pipelines and associated infrastructure, and own one of the largest fleets of dedicated pipeline construction equipment in the country. Mitchell Water also designs and builds water storages and pump stations including pumps, controls and SCADA systems.

Their in-house skill base includes engineering, estimating, design and on-ground technical skills. "The 18,000 km network of open channels has been replaced with pressurised pipeline, both trunk and distribution pipelines, and we have also built storage facilities and pump stations," said Mitchell Water's Commercial Manager Roger de Maid. "There are enormous water savings, water is not lost through evaporation, contamination, leakage or seepage; security of supply is now 96 per cent.

"We started at a time of very high activity in industry, so the procurement of materials, statutory approvals and access to a skilled labour force was a major challenge. If you put all the Acts we've had to conform to in a pile, you wouldn't be able to climb over them without oxygen. We handled all of that in-house. "One of the key things we've had to do is negotiate with the landowners, 1000s of them. There were a full range of environmental issues, construction happened within a very tight environmental envelope. If we stripped topsoil, it generally had to be replaced within three days."

Pipe diameters laid for the WMP ranged from 50mm to 1m, types of pipe included PVC, polyethylene and mild steel. Construction was controlled by GPS positioning systems and a GIS information system. An advanced vibratory plough technology was utilised to install small diameter pipe, this minimised impact by retaining topsoil in situ. "One of the real highlights is that in 900,000 manhours on this project, there was not one reportable OH&S incident, and not one minute lost to industrial disputes," said Roger. "We have a strong commitment to safety, and a strong commitment to our workers."

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MAKING WATERWORKS READY TO FLOW

Turnkey pump and water storage solutions for the Wimmera Mallee Pipeline Project were provided by BKB Envirotech to main contractor Mitchell Water. They manufactured and installed pumping equipment for 29 Pump Stations, manufactured and installed 21 water storage tanks ranging from 150 kilolitres to 2,250 kilolitres, supplied the infield control valve assemblies, and did the works performance testing and site commissioning for Stages 1, 2, 3, 4 and 6.

It is a showcase for their extensive experience in delivering purpose-built packages for water supply solutions. BKB Envirotech with sister company BKB Pumps and Tanks, share a 4,000m2 fabrication and assembly area, along with design and drawing facilities. BKB Envirotech Director Andrew Black started the new division based on thirty years Australian and international experience designing and installing pumping and pipeline systems, including project management and commissioning of SCADA control for 146 pumping sites in Dubai, and extensive work in the area of treated effluent disposal.

Other creditable projects include supply of Pumping equipment for Darling Anabranch Pipeline Project, Tungamah Pipeline Project, Werribee Recycled Water Project for City West Water, Kangaroo Ground Pump Station for Yarra Valley Water and Port Fairy Water Treatment Plant.

Their services extend beyond mechanical water infrastructure to include building services such as stormwater and sewerage systems, hot water plants, constant pressure systems, booster and tank fill packages, and chilled and condenser water pumps. They also provide complete fire protection systems, tanks and water storages, and can meet all the needs of Green-age constructions with black and grey waste water treatment systems, rainwater recycling, filtration, along with sewage and storm water pits.

Nothing is left to chance: everything is designed to order by experienced engineers who understand the challenges of liquid handling systems. Then the entire system is fabricated and manufactured in-house by highly skilled tradesmen using state of the art specialist equipment which includes a NATA-accredited testing bay capable of handling flow rates of up to 400L/second. All their systems are quality certified to ISO 9001:2000.

"Our company's approach is to provide innovative packaged solutions to our clients, and our ability to provide solutions for onsite services sets us apart from our competitors," said Andrew.

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EARTHWORKS WITH MAXIMUM ACCURACY

Performing the extensive civil contracting for the Wimmera Mallee Pipeline Project gave Miller Contractors a terrific opportunity to showcase some state of the art technology.

Their fleet on the project used 3D GPS modelling and machine control. "This enabled accurate trimming, because the operator can see the project's model on screen in the grader they have more accurate control of the job, which means a lot less reworking," explained Miller Contractors's Director Jay Miller. "Fill can be placed quickly and efficiently where required and cut to grade in a single pass, eliminating several level checks and costly reworking. "The 3D GPS-based modelling eliminates most survey control pegs, it also eliminates the need for a full time survey team at each work site. An entire site can be controlled by one person using a survey rover, who checks each day's quantities; the actual operators can see their job as it evolves on their own screen. "It revolutionises how we do work, and the benefits for projects such as multiple lane highways are enormous, as it cuts final trim work down to a quarter of the time.

"The problems faced with old fashioned survey techniques such as stringing were exposed when we had to construct consecutive overtaking lanes which effectively left us in a situation of having to string 4 lanes wide under traffic. This difficulty led us to invest in 3D. We already had a long association with Topcon's level control equipment so adding the 3D GPS control was a natural progression." Multi lane highways are among the civil projects Miller Contractors have tackled from their base in Victoria. "We can do anything from the civil construction field, we build highways, roads, and subdivisions, perform commercial site works, construct reservoirs, undertake contract mining, do bulk haulage and have our own quarries around Western Victoria for supplying gravel and sand materials," said Jay.

The Wimmera Mallee Pipeline utilised a broad range of these corporate abilities. Miller Contractors constructed much of the civil infrastructure required for the two million hectare project area's 8,800 km pipeline distribution system. Miller Contractors supplied sand for backfilling along much of the trunk mains, supplied quarried products, built all of the pump station roads and internal civil works and built new reservoirs. These included completion works at Jeparit reservoirs, de-silting and remodelling an existing twin reservoir at Donald, and constructing new reservoirs at Volcano, Charlton and Brimpaen. All reservoirs were clay lined constructions with a HDPE liner.

These earthworks projects have taken place over the past 3 years and have covered a large geographic area. "There were a hundred and one challenges with these projects," said Jay. "They included stringent water conditioning of the materials and tight finished grade levels to allow liner placement"

Over the 38 years they have been in the civil construction and plant game, Miller Contractors have acquired an impressive fleet of heavy machinery. The other part of their business is Dry Hire. With a specialised hire fleet which includes dozers, scrapers, excavators, GPS controlled graders and laser buckets, articulated dump trucks, compactors, rollers, water trucks, backhoes, wheel loaders and skid-steers, road patching trucks and profilers Miller Contractors are able to offer equipment to service the needs of the smallest project through to the largest.

"We try and run our equipment hire side of the business as a one stop shop, so we can hire complete packages for a project. Some clients have a need to hire one item of plant for a project while other clients will hire a complete package of equipment for their projects. This of course offers the client very flexible control over their equipment," said Jay.

Miller Contractors also have heavy haulage low loaders with dollies for the shifting of large equipment, along with their own crane and telehandlers. All equipment is available with operators for contract work throughout Victoria and South Australia. They have a workforce of 50, many of whom are long-term employees with extensive experience in civil construction.

Major projects include extensive work on roads and highways throughout Western Victoria, Mine infastructure, Grain storage facilities, new hospitals, industrial sites, residential subdivisions, wetlands and water storages. They service both private and government clients, and have extensive experience in meeting the specific requirements of regional projects such as mining, rural infrastructure and roadworks, supplying men, machines and materials.

They have the ability to deliver specialist services including large building Demolition, spray seal, asphalt, landscaping, concreting, drainage and water infrastructure.

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BLAZING TRAILS WITH SMALLER FOOTPRINTS

When it comes to tackling critical sustainability issues, Lotic (formerly PMP Environmental) are truly walking the talk. Their projects to date save an estimated 800,000 tonnes of CO_2e emissions per year every year, and they have contributed to saving many thousands of mega litres of water through their contribution to projects such as the Wimmera Mallee Pipeline. Lotic's motto is, 'water matters'. They have been in the water and wastewater industries since 1973, and expanded into the area of geomembrane installation in the 90s, undertaking one of Australia's first geomembrane installations at Melbourne Water's Western Treatment Plant. BRW have recognised their rising star with a place of 49 in this year's 'Fast 100' companies listing.

For the Wimmera Mallee Pipeline project, they provided geomembrane liners for storage basins at Pimpinio, Rainbow, Dimboola, Japarit, Warracknabeal, Hopetoun and Murtoa. The sites, some of which had two basins, were a mix of basins needing reconfiguration and cleaning out, and those that only needed lining. At Murtoa, Lotic were also contracted to construct the earthworks, pipe works and electrical works, a task that involved the use of known, reliable subcontractors from their extensive network such as Ladd Electrical and Allequip earth works.

"Manpower and materials were the challenge, with the collapse of the timeframe," said Lotic Director and General Manager Operations, Paul Dick. "We use our own specialist equipment for installation. The geomembrane is made of HDPE, and is 1.5mm thick. It comes in rolls 100m long and 7m wide, which is deployed on site using specialist equipment. It is then welded using a heat weld done by a specialist machine. We run a mini-apprenticeship to train people in the welding, which is all quality tested and the results archived and recorded. "We performed extremely well on the environmental scorecard. At Murtoa we had a Safety audit and we achieved 97 per cent which is of a high standard for Safety management."

There is a whole other realm of possibilities that HDPE membranes offer, and that is the collection of biogas. Lotic have installed the Covered Anaerobic Reactor Methane Harvesting Activities (CARMHA) technology at projects in Australia and SE Asia. CARMHA involves a floating geomembrane cover on sewage or waste water storages which collects methane, which is then used to fuel engines to generate electricity or alternatively fuel boilers. This not only reduces the greenhouse gases emitted by liquid wastes, but also reduces site utility bills, further cutting the carbon footprint down to a sustainable size.Melbourne Water through the STaPS Alliance recently awarded Lotic a major contract to assist with the design and constructability for works at their Western Treatment Plant which it is anticipated will result in a contract for the installation of the largest geomembrane cover for biogas harvesting in the world.

Lotic have 37 staff spread between offices in Melbourne, Perth, Singapore and Sydney. Their talent base includes engineers, process engineers, mechanical engineers, plumbers and skilled labour. Up to ten of their staff on any given day between December 2007 and June 2009 were working on the WMP.

"We can conceptualise, design, install, operate and maintain anything to do with water, waste water or co-generation ," said Paul. Other major projects they have worked on include the tertiary treatment adjacent to Melbourne Water's Eastern Treatment Plant, the mechanical installation at the Aurora Water Re-Use plant for Yarra Valley Water, and a major mechanical installation for Melbourne Water's new Tarago Treatment Plant. In Western Australia they have completed multiple projects in the agricultural sector, and in Victoria they are part of the visionary Victorian State Government Northern Victoria Irrigation Renewal Project.

In what will be Australia's biggest ever irrigation investment, $2 billion will be spent in stages one and two of modernising the Goulburn Murray Irrigation District, with the goals of providing certainty for irrigation-dependent agriculture, and of recovering 425 gigalitres of water currently lost to the system through seepage and leakage in earthen channels, evaporation, and faulty metering.

Their talents are relevant across the development spectrum, from Green Star commercial projects through to major civic infrastructure. In addition to CARMHA and water storage geomembranes, they can design and construct systems for cogeneration, aeration, scrubbers, flares, pipelines, and biological processes, in addition to refurbishment, repair and upgrades to plumbing of any magnitude. They also designed and manufacture the Aussie Bladda Tank.

Their mission is to work closely with clients to meet their needs by providing impeccable, innovative solutions of excellent quality, both in design and construction, to enhance our working and living environments.

Lotic
water matters

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CLEARING THE WAY FOR PROGRESS

When construction contractors venture onto site for a major project like the Wimmera Mallee Pipeline Project (WMPP) they go equipped and forearmed with a rule book prepared by Maloney Field Services (MFS). This rule book contains a comprehensive set of protocols for entering and working on a landholder's property like which access tracks can be used and which tracks to stay off, where the underground polypipe providing stock water is located or other important information like which tree has the family dog buried beneath it. All important information provided by a landholder during negotiations is recorded to ensure a project causes as little interruption to landholders as possible and that contractors can get the job done as quickly as possible.

This document, the Construction Line List for the WMPP comprised 1,200 pages. It was the result of MFS staff negotiating with approximately 2,100 landholders affected by the project. MFS also negotiated 299 easements, 1,800 access agreements and Notices to Enter Land and purchased 21 sites for above ground facilities. To add to the challenge, the project was scattered over a vast swathe of Victoria's prime agricultural country.

'It took the best part of 4 years', said MFS Director Jamahl Waddington. 'The project consisted of 7 systems and 5 trunk mains. GWMWater decided it would acquire easements over all the transmission pipelines. We had to assess compensation for easements and prepare all documentation for negotiations. For the distribution pipelines, we negotiated access agreements to all properties and consulted and liaised extensively with all affected landholders to produce a comprehensive Construction Line List document detailing all cautions, special conditions and contact details for every landholder affected. It is a rule book for contractors and goes down to the detail of gates and use of access tracks and must be detailed and not ambiguous.'

'We were first engaged for a 10 year project which was condensed to 5 and then down to 3 years. The time frames moved constantly. Essentially there were 7 to 8 different major projects within the whole task all with different deadlines which required a great deal of co-ordination. Every discussion our land access personnel had with each and every landholder was recorded on our Projects Database. In full swing we had 15 land access personnel in the field.'

While rural landholders' enthusiasm for the distribution lines was unanimous as all were receiving an off-take of water from the new system, the trunk lines posed some issues, in some cases needing to pass through communities which were receiving no direct benefit from the project and would experience significant disruption. The Grampians town of Halls Gap for example had issues with the pipeline passing through a densely populated tourist area, including literally passing through the caravan park.

This is where MFS' ability to co-ordinate land acquisition programs and negotiate compensation came to the forefront and provided a workable solution for all parties. MFS' 45 personnel have two outstanding attributes – high level interpersonal skills and communication skills. 'Our land agents mostly hail from a rural background' explained Jamahl. 'They generally have a background in stock and station or a real estate/property background. They are not showing up in a suit. In our office we have a dedicated team of paralegal staff who provide strategic advice on land acquisition matters together with a team of property valuers, land agents, project managers and project directors. Our job is to consult with everybody and ensure that workable agreements are negotiated with landholders treating them with respect and integrity at all times. In addition we do all stakeholder management for a project including liaising with Shires, Government and Industry groups.'

'Now that the WMPP is substantially completed most of our land access personnel have been deployed to other parts of Australia working on various major infrastructure projects including gas pipelines and railways'.

MFS was established in 1970 and is able to draw upon decades of experience in land access. Their headquarters remain in Adelaide whilst they have established offices in Melbourne, Newcastle, Brisbane, Darwin, Gladstone and Roma. MFS undertake land and easement acquisition for water and gas pipelines, transmission powerlines, railways, wind farm and renewable energy projects, fibre optic projects and roads. Their impressive client list includes companies such as Santos, Origin Energy, BHP, AGL and Epic Energy.

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