

NEW TECHNOLOGY DOWNS EMISSIONS

MAIN CONSTRUCTION COMPANY : Laing O'Rourke
CLIENT : Origin Energy
ARCHITECT : CH2M HILL
ENGINEER (STRUCTURAL / CIVIL) : CH2M Hill
COMPLETION : Early 2010
SURVEYOR : Pacific Survey
SIZE/AREA COVERED : 10,000m²

DARLING DOWNS POWER STATION

A newly operational power station on the Darling Downs is proof positive that new technology can reduce greenhouse gas emissions. The Laing O'Rourke-constructed Darling Downs Power Station is Australia's largest combined cycle power station, providing cleaner natural gas-fired electricity while using less water than conventional coal-fired power stations.

Laing O'Rourke worked in partnership with global technology leaders CH2M Hill to produce this next generation power station which has the capacity to power 400,000 homes. Located at Braemar near Dalby, 256km northwest of Brisbane, the power station is owned and operated by Origin Energy.

The power station will take advantage of the rich source of coal seam gas reserves held by Origin Energy in south west Queensland. Because it is powered by new technology using natural gas, greenhouse gas emissions are 20 per cent less than that generated by coal-fired power stations of a similar size. According to the project's Construction Manager, Glen Orr, this will save 2.5 million tonnes of greenhouse gases being emitted annually. "This is equivalent to taking 600,000

cars off the road each year, which is a significant saving for the environment," Mr Orr said. "But there are other environmental advantages too, we have constructed a closed-system, air cooled condenser which will use only two to three per cent of the water that a conventional power station uses. This will represent a huge saving in water usage over the life of the power station."

Work on the \$780 million project began in August 2007 and the power station will be fully operational in 2010. Despite the remote location and a very tight timeframe, the project progressed well. "Our team, which numbered 780 during peak periods, operated 24 hours a day, seven days a week," Mr Orr said.

"Safety was of paramount importance and I am proud to say that we celebrated a major milestone of having worked one million man hours, with only one lost time to injury," Paul Farnworth, Project Director for Origin Energy said that he and the company were very pleased with the project. "Obviously a complex project in a semi-remote location is not without its challenges, but on the whole, the project progressed very well," Mr Farnworth said.



Profile on Laing O'Rourke

Laing O'Rourke is one of the world's most dynamic and innovative privately owned development, construction and specialist companies. The business operates across three international hubs – Europe; Middle East/India; Australia/Asia. The company has more than 30,000 employees worldwide and an operating turnover of almost \$11 billion.

Laing O'Rourke began operations in Australia in 2004 and, in 2006, acquired Barclay Mowlem, one of Australia's leading multi-disciplinary construction and services companies. Laing O'Rourke Australia has more than 2000 employees. The company's diverse capabilities include building, development, rail, mine infrastructure, power, water and civil infrastructure.

Laing O'Rourke's Australian clients benefit from the specialist international construction expertise of being part of a multi-billion dollar organisation. For clients and communities, we are committed to engaging in an authentic and responsible manner. We will actively reduce our carbon footprint, advocate greener construction practices and treat our stakeholders as long-term business partners. At the heart of our ethos is a belief that collaboration is key to delivering value. In Australia, the company has offices in Sydney, Brisbane, Perth, Darwin, Cairns, Townsville, Toowoomba and the Hunter Valley.

Profile on Origin Energy

Origin Energy is Australasia's leading integrated energy company focused on gas and oil exploration and production, power generation and energy retailing.

Listed in the ASX top 20 the company has around 4,000 employees, is a leading producer of gas in eastern Australia, is the largest owner and developer of gas fired electricity generation in Australia and is a leading wholesaler and retailer of energy. The company services more than 3.5 million electricity, natural gas and LPG customers across Australia, New Zealand and the Pacific. Origin's strategic positioning and portfolio of assets provide flexibility, stability and significant opportunities for growth in the ever changing energy industry. Through Australia Pacific LNG, its 50:50 joint venture with ConocoPhillips, Origin is developing Australia's largest CSG reserves base into the country's largest CSG to LNG project.

In New Zealand Origin is the major shareholder in Contact Energy, New Zealand's leading integrated energy company, operating geothermal, thermal and hydro generation facilities and servicing electricity, gas and LPG customers across both the North and South islands. Origin also operates several oil and gas projects in New Zealand and is one of the largest holders of petroleum exploration acreage in the country. Origin has investments in renewable energy, a strong focus on ensuring the sustainability of its operations and is the largest green energy retailer in Australia.

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"We wrestled with a tight schedule but the costs were kept under control and the quality of the design and the work performed were both very good. The significant focus on safety by Laing O'Rourke was very pleasing."

Darling Downs Power Station fast facts:

- \$780 million project for Origin Energy.
- Located 256km northwest of Brisbane, at Braemar near Dalby in Queensland's Darling Downs.
- The biggest combined cycle power station in Australia.
- Construction started in August 2007 and will be fully operational in 2010.
- The power station will produce 20 per cent fewer greenhouse gas emissions than conventional power stations.
- The power station will use two to three per cent of the water used by conventional power stations, due to the use of air-cooled condensers.
- The project employed up to 780 people during construction, of these 120 were locals from the Darling Downs. This reduced to 40-50 during the commissioning phase and 35 staff once the station is operational.

Darling Downs Power Station, QLD



RISING WITH RELIABILITY

When you're a relatively small company, breaking into the highly competitive earthmoving industry can be an even tougher job than the projects you tackle. One of the key factors that contribute to success for small business is proven reliability. A factor that McInnis Water Cartage has not only proven over 5 strong years in business, but reliability is also proving to be the key to their growing success.

Based in Dalby, 84 klms north-west of Toowoomba in Queensland, McInnis Water Cartage has just completed work on their first major power station project, the \$780 million Darling Downs Power Station for Laing O'Rourke. McInnis provided a range of services to the project including dust compression and road construction, general backfilling, roads around the footings and slabs and spreading 20mm gravel.

The company's reliability was a key contributor to their success on this large infrastructure project. Reliability from both their high quality workforce and their well maintained equipment.

McInnis were committed to maintaining face to face communication on a daily basis with the Laing O'Rourke site supervisor, communication which ensured their strong performance and a highly successful outcome.

Malcolm McInnis started the business in 2005 in Goondiwindi, using the wealth and depth of his previous 10 years experience in the earthmoving industry to establish his own operation to service the fast-growing north-west Queensland area. With a commitment to investment in a quality fleet of equipment and establishing a strong, stable workforce, McInnis Water Cartage has grown to become a highly respected sub-contractor.

The company specialises in water cartage, tipper, 5T excavator and bobcat hire with highly skilled and fully qualified operators and service personnel to maintain their fleet of equipment to ensure reliability and performance in even the harshest working conditions.

As locals, Mal and his team are ideally suited to face the tough conditions created by the severe summer temperatures, while working on the Darling Downs Power Station project. A major infrastructure project which brings many benefits to both the environment and the local areas, emitting about half the greenhouse gas emissions that a coal-fired power station using current technology would create, saving 2.5 million tonnes of greenhouse gases a year and creating many jobs within the region.

The McInnis Water Cartage crew successfully tackled the challenges of working 11 days on 3 days off on a semi-remote site with a tight timeframe to successfully complete the project on schedule and on budget.

While McInnis has completed numerous general subdivisions in Dalby for leading contractors, Ostwald Bros and Bilfinger Berger, the Darling Downs Power Station was McInnis' first project for Laing O'Rourke.

Business owner, Malcolm McInnis, hopes the company's performance on this project will not only lead to further work with Laing O'Rourke, but will also put McInnis Water Cartage on the preferred sub contractors list for other major projects in the area.



"We have the manpower and the quality fleet of equipment and we're available to take on major projects within 200klms of Dalby", Malcolm McInnis said.

With the Darling Downs Power Station now completed, McInnis Water Cartage are busy providing services to housing developments, shed pads and domestic water delivery while awaiting their next major infrastructure project.

McInnis Water Cartage is yet another small Australian business success story which is set to become a big story as their reputation for reliability continues to build.

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BROTHERS IN SAFETY AND EFFICIENCY

As a company committed to improving workplace safety and productivity through innovation and technology, Ostwald Bros is proud of the safety and efficiency achieved during works associated with the Darling Downs Power Station project.

Ostwald Bros (OBC) was able to meet the stringent safety standards required by the oil and gas environment completing a range of works including bulk earthworks, installation of drainage, culverts and fencing and the construction of roads, ponds and wetlands for the Talinga Gas Plant project which feeds into the Darling Downs Power Station.

As a cost-effective means of increasing the sub-grade integrity, OBC used the relatively new technique of Polycom stabilisation to deliver the project within specification requirements. Ostwald Bros utilised millimetre GPS on plants and supplied all gravel for its construction role from the company's hard rock quarry located on the Darling Downs.

A diversified, family-owned civil construction company, Ostwald Bros operates Australia-wide, providing high quality project management across a range of civil construction capabilities.

Based in Dalby in western Queensland, Ostwald Bros specialises in regional and remote developments recently completing projects for companies such as Queensland Gas Company, Origin Energy, Arrow

Energy and CS Energy. The company currently employs around 400 people and owns and operates an extensive transport fleet which carries out major product haulage as well as supporting OBC's plant and equipment.

Its concrete and quarries division provides pre-mix concrete for structural concrete works and strengthens the company's project delivery capacity on industrial and commercial projects with quality assured materials.

With a reputation for consistent performance, budget compliance and on-time deliverables across its range of key services - civil construction, transport, concrete and quarries - Ostwald Bros continues to deliver excellence after 20 years in the business.

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GEOTECHNICAL EXPERTISE

As the on-site Geotechnical Testing Authority for the Darling Downs Power Station project, South Qld Soils has further enhanced its reputation as a highly respected sub-contractor with the capabilities and technical expertise to successfully deliver large-scale, long-term projects for some of Australia's largest contractors.

From the earliest stages of site preparation for this \$780M infrastructure project, South Qld Soils established a NATA accredited on-site laboratory with a full time, highly trained technician. This on-site facility remained in place to carry out testing throughout the 2.5 year construction period.

Working closely with the Laing O'Rourke project management team, South Qld Soils carried out a comprehensive range of geotechnical testing at various stages of construction.

With the back up technical support of the company's NATA accredited laboratory in Chinchilla, the on-site facility provided Level 1 Supervision of the earthworks, compaction testing, concrete testing as well as testing for the hardstand parking areas and roadways.

South Qld Soils once again proved their capabilities in providing high quality, highly accurate and reliable services over a long period to a major infrastructure project.

The company is also currently carrying out a 3 year contract as the on site testing authority for the Hinze Dam expansion project. They are also presently providing on-site services in regards to realigning roadways for the proposed Wyaralong Dam project in Queensland and the realignment of the Bruce Highway from Cooroy to Curra for the Queensland Department of Transport and Main Roads.

Through their previous affiliated company and in their own right, South Qld Soils have been providing soil testing services to major projects for over 25 years and have NATA accredited laboratories in Brisbane, Toowoomba, Roma, Chinchilla and Narrabri to service the southern Queensland and north west NSW construction industries.

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PIPES AND PRESSURE

With the \$780 million Darling Downs Power Station due to be operational this year, C&V Pressure Welding have expressed their congratulations to Laing O'Rourke for their commitment in delivering this major infrastructure project in the south-west Queensland town of Dalby on time.

"There were two significant reasons which attributed to the overall success of this project Charlie Bryce, proprietor of C&V Welding said. "The selection of the Laing O'Rourke management team and the fact that Laing O'Rourke had the capability and experience to complete the entire contract including the civil, structural, mechanical and electricals", Charlie said.

C&V Pressure Welding, owned and operated by Charlie Bryce, specialises in pipe work fabrication and installation, supply of pressure welders and pipe fitters and were involved in the Darling Downs project over an 18 month period.

The company supplied over 90 specialised pressure welders, pipe fitters and supervisors to the 650 mega watt fired power station project, making it one of C&V's largest current contracts.

Operating for over 30 years, Charlie Bryce personally carefully select their specialised workforce who are fully ticketed and experienced in pipe preparation, alignment and butt welding for a wide range of materials, to both Australian and International standards.

C&V's have been involved in the piping industry since 1980, working on power stations from Eraring in the 80's to Tarong and now to Darling Downs today. The company has diversified throughout the past 30 years into such jobs as the Abbott Point Coal Terminal, the Western Corridor Recycled Water Project, the Alcan Gove Third Stage Expansion Project, and the Dampier Wharf Project.

The company works in both the construction and maintenance industries, providing services to power stations, petro chemical plants, the sugar industry and mining operations throughout Australia.

C&V's highly specialised services involve the fabrication and installation of a range of materials including Heavy Wall Piping (big bore) from 2mm to 100mm wall thickness, 9% chrome through to 347 stainless steel.

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A TANK FULL OF SOLUTIONS

Australian owned and with manufacturing sites across South East Queensland and South Australia, RPG Australia is a leading heavy steel manufacturing company that specialises in the delivery of Integrated Steel Solutions.

With clients across the Mining, Engineering & Infrastructure, Renewable Energy, Oil & Gas, Defence and Manufacturing sectors, RPG has the skills and capability to design, fabricate, manufacture and assemble products, structures and equipment from steel.

In late 2009, RPG acquired AquaCon, previously a division of Australian Water Systems. This acquisition has allowed RPG to add further engineering capacity, bolted tank expertise and a foothold within the large volume modular liquid storage tank market.

Modular tank solutions are tailored to clients' requirements offering a full suite of engineering, fabrication and project management capabilities. This includes tank design (volumes ranging from 50KL up to 40ML), foundation design, tank manufacture, project management, complete design and construction, onsite tank construction, commissioning, tank refurbishment, elevated tank and stand roof replacement, tank coating and MDR documentation.

In 2007, AquaCon was involved with the manufacture of three modular tanks at the Darling Downs Power Station, located at Braemar, 40km west of Dalby, Queensland. With Origin Energy Australia as the client, AquaCon designed, fabricated and installed three large volume modular liquid storage tanks each with highly specific and distinct requirements:

- Service/Fire Water Tank (9,280mm height and 24,107mm diameter)
- Demineralised Water Tank (6,405mm height and 10,227mm diameter)
- Waste Water Tank (7,555mm height and 13,880mm diameter)

The project reflects the experience and professionalism of the RPG design philosophy which focuses on delivering quality solutions. Tanks are designed for full and empty conditions featuring efficient and safety conscious design elements including a self supporting roof, ring beam footing design, side access hatch, roof hatch and platform and ladder system. All tanks are compliant with AWWA D103 design code, AS1657, AS1170 and RPEQ certified. Each tank also comes with a 40 year design life, 20 year service life, full hot-dip-galv structure, 100 micron epoxy coating thickness and 3mm minimum stake thickness.

RPG also designs and fabricates welded above ground bulk storage steel tanks and pressure vessels for the Infrastructure, Oil and Gas, Petrochemical and Agriculture market sectors. Each tank is custom fabricated to clients' exacting specifications using quality Australian standard steel.

RPG is committed to Safety, Quality and the Environment, and this is reflected in the way we do business, our products, our service-orientated approach and safety records.

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WACOL | RICHLANDS | ADELAIDE | DALBY | MELBOURNE





THE HEAT HANDLERS

Heat Tech National was established in 1999 with the aim of increasing the Heat Treatment and associated engineering service levels to the mining, construction, petrochemical, manufacturing and power generation sectors.

The company has developed into a highly regarded contractor on major power stations, chemical plants, mining operations and workshop projects with the capabilities of adapting their processes and procedures to suit the unique requirements of individual projects.

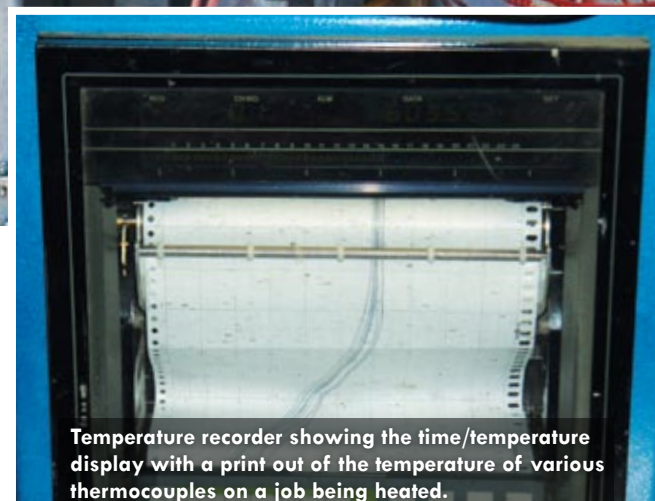
As Heat Treatment contractor on the Darling Downs Power Station project, Heat Tech National faced an unusual challenge relating to the cold winter temperatures.

The scope of works on the project was to supply Preheat and Post Weld Heat Treatment to a certain number of the welded pipe joints. Preheating involves heating the area of the pipe to be welded to a set temperature, usually around 200°C, determined by the relevant welding code, then maintaining this temperature during the welding operation.

Post Weld Heat Treatment involves heating the welded area of the pipe in a controlled manner to a peak temperature of around 750°C and holding this for two hours and then slowly cooling in a controlled manner to ambient temperature with the heating cycle calculated using the relevant welding code.

To cope with the size of this project, Heat Tech National operated both day and night shifts, as once these heating cycles commence, they cannot be interrupted.

An unusual problem encountered was when each of the boilers had to be pressure tested, the winter temperatures were so low, HTN were required to raise and hold the temperature of the water for several days while the tests were completed.



Temperature recorder showing the time/temperature display with a print out of the temperature of various thermocouples on a job being heated.



To achieve the desired temperature, HTN placed approximately 100 heating elements around various piping in the boiler.

Heat Tech National provides a specialised range of services including Pre-Heating, Post-Heating, Stress-Relieving, Normalising and Refractory Dry outs and is currently working on regular maintenance of mining equipment and the Caltex refinery major shutdown.

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HIRE AND HIRE

After developing a highly effective safety and environmental management plan for their work on the Tarong North Power Station, Casco Civil Construction was contracting to provide equipment and services to Laing O'Rourke for the construction of the Darling Downs Power Station in Dalby, Queensland.

Casco Civil Construction offers a wide range of services and equipment backed by over a decade of experience and their own workshop and maintenance facility in Griffin.

Casco have a division dedicated to the construction of roads, drainage, bulk and detail excavations and footings as well as a bulk transport division for the cartage of raw or processed materials and also provide plant and crane hire, load, haul, place and compact. With the capability of providing a wide range of services, Casco is highly regarded for cost and time saving benefits they bring to key projects.

For the Darling Downs Power Station project, Casco Civil supplied four excavators and several tandem tippers, just a small part of their extensive fleet of up to date and well-maintained equipment.

Their fleet of equipment includes truck and quad dogs, truck and super dogs, 10m tip trucks, water trucks, a float, backhoes, excavators, compactors, hydraulic cranes and a Manitowac 300 tonne mobile lattice crane.

Casco Civil are currently working on an extensive range of major projects throughout south east and western Queensland, a testament to their experience and impressive track record over 10 years in business.

In addition to work on both Tarong North and Darling Downs Power Stations, Casco's impressive portfolio of work includes drainage contract for Queensland Main Roads; various contracts for Pacific Power, Leightons, Clem 7 tunnel, Summer and Staff, Tarong Energy, Barclay Mowlem, St Hilliards, Hanna Doud and bulk haulage contracts



for Pacific Power, Southern Pacific Sands, Basics, Jimbour Quarry, Kingsfeld Group, Ostwald Bros and coal haulage for Rio Tinto.

With their enviable reputation, Casco Civil has also provided trouble shooting expertise to contractors including Leightons and Neumanns.

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IN LINE FOR SUCCESS

Specialising in large engineering and civil construction projects, the dynamic and progressive Pacific Survey, was responsible for the provision of all surveying services on the \$780m Darling Downs Power Station in Queensland.

Contending with the impact of severe temperatures on measurement, Pacific Survey provided surveying services for the construction of all structures, alignment of the turbines as well as civil works such as roads and drainage.

With over 20 years experience in the industry, Pacific Survey provides a diverse range of surveying services to companies in the Construction, Mining, Civil Engineering and Marine industries, proudly serving a growing client base, up and down the East Coast of Australia, the Pacific Region and beyond.

In addition to a strong depth of professional staff, Pacific Survey's in-house auditing of Quality Assurance Procedures and regular on-site visits by QA Managers provide valuable client and staff support, and ensures utmost accuracy, efficiency and customer satisfaction.

Pacific Survey are currently working on the Port Botany Expansion Sydney, Victoria Road Bridge at Rozelle, Southern Sydney Freight Line, Kempsey Bypass Pacific Hwy, Cameby Downs Coal Mine Expansion, Darra to Springfield Transport Corridor and the Varsity Lakes Interchange Upgrade Pacific Motorway among other projects.

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Darkubg Downs Power Station, QLD



PROMPT SERVICE TO DARLING DOWNS

Laing O'Rourke operated to a very strict timetable on the construction of the Darling Downs Power Station 50km West of Dalby in Queensland. Brisbane based concrete cutting contractors, Queensland Concrete Drilling and Sawing (QCDS) were approached because of their proven track record and commitment in providing their clients with prompt and efficient service, ensuring tight schedules for completion were maintained.

In many instances QCDS were required on site with only a few hours notice. The long distance between the project site in Dalby from their head office in Brisbane presented logistical challenges for the team. QCDS needed to ensure that they always had the correct plant and equipment for every situation as well as being able to service additional work for other sub-contractors whilst on site.

QCDS was contracted to provide concrete cutting services to this massive infrastructure project and utilised the latest technology in diamond cutting and environmental equipment to complete the work. Their services include drilling large diameter cores, handsawing, ringsawing, floorsawing, track mounted hydraulic wallsawing, bursting, wire sawing, concrete x-ray (GPR), soffcut early entry joints, electric sawing, scarifying and grinding.

Formed in 1996, QCDS has built a sound reputation for prompt and reliable service leading to impressive growth in their portfolio of completed projects throughout Queensland. In addition to the Darling Downs Power Station project, QCDS is also currently working

on major projects at the Brisbane Domestic Airport Terminal, 123 Albert Street in Brisbane, University of Qld School of Vet Science at Gatton, Mount Ommaney Shopping Centre, Mater Hospital Carpark & Auditorium and RAAF Base Amberley as well as many others.

QCDS pride themselves on their quality service, delivered by a team of 10 highly committed and skilled operators working with the latest technology and equipment.

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