POWER AND WATER CORPORATION

2010 Indigenous Essential Services Annual Report

PowerWater

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Chairman and Managing Director's Report

In conjunction with Power and Water's program to deliver the largest ever investment in essential electricity, water and sewerage infrastructure, over the past 12 months Indigenous Essential Services (IES) has also considerably expanded, upgraded and repaired these essential services in remote communities.

Demand for electricity in remote communities has significantly increased in order to meet the policy initiatives of Closing the Gap on Indigenous Disadvantage and the joint Australian and Northern Territory Governments' Strategic Indigenous Housing and Infrastructure Program (SIHIP).

In the past year there has been enormous progress towards greater use of renewable energy in remote communities; greater involvement of the community in managing and conserving water with the implementation of Community Water Plans; and greater focus on improving the quality of water in remote communities.

To this end, for the first time the annual water quality and water sustainability reports for Northern Territory remote communities, which previously were delivered as separate reports, have been incorporated into this, the IES Annual Report.

Working in line with the Northern Territory Government's Climate Change Policy, the use of renewable energy to produce electricity in remote communities has grown, and inefficient diesel power stations are decommissioned where possible.

Renewable energy, integrated with conventional generation technology using distillate and gas fuel, are now core business for IES.

Following extensive negotiations, in early 2010 Power and Water, through IES, purchased the solar dish power stations at Hermannsburg, Lajamanu and Yuendumu after the owners went into administration.

IES is also currently negotiating a power purchase agreement for the construction and operation of additional solar power stations at Kalkarindji, Ti Tree and Alpurrurulam; which will come on line in early 2012.

The acquisition of these solar power stations highlights the need for specific knowledge and skills – both within Power and Water and from the Essential Services Operators in these communities.

Training initiatives have been specifically designed for ESOs to continually develop their skills in these new areas.

Judith King, Chairman

Andrew Macrides, Managing Director

Highlights of 2009-10

- Delivery of 112 Gigawatt hours of electricity, 10 Gigalitres of water pumped and four Gigalitres of sewage treated for Indigenous towns and communities in the NT.
- Decommissioned the power station at Yuelamu and built a 44km power line to nearby Yuendumu power station.
- Invested in computer control equipment for bores and water infrastructure in Wurrumiyanga (Nguiu) that will see a 25 per cent saving in water each year.
- Established a joint infrastructure delivery team with the Department of Housing, Local Government and Regional Services to deliver land servicing and essential services to remote communities, under the Strategic Indigenous Housing and Infrastructure program (SIHIP).
- Embedded four permanent staff to work specifically on timely delivery of SIHIP projects.
- Recent Customer Satisfaction Survey results indicate Power and Water is trusted and appreciated by its customers in remote communities.
- Operated in a safe manner with no Lost Time Injuries.
- Transported 30.24 million litres of diesel fuel to power stations across about 1 million kilometres in the Northern Territory at a cost of $23.4 million with all stations kept running despite the harsh wet season.
- Collected and tested more than 7500 water samples to monitor water quality in accordance with the Australian Drinking Water Guidelines.
- Commissioned three liquid chlorine disinfection systems in the Southern region.
- Further developed Community Water Plans in four water stressed communities that identify water conservation actions that can be carried out within the community.
- Designed water saving initiatives for a water conservation program with residents in Warrabri (Ali Curung) and Milingimbi.
- Discovered alternative groundwater sources in Nauiyu (Daly River) and Alpurrurulam which will increase water quality and availability.
- Commissioned a new power station at Willowra, with a life span of 30 years.
- Upgraded the Yilpara power station with the installation of two new generating units and a new switchboard.
- Installed 24 automated groundwater monitoring stations across 12 communities, which will improve our ability to manage current and plan future community water sources and ensure more secure water supplies.
- Purchased three solar dish power stations in Ntaria (Hermannsburg), Lajamanu and Yuendumu to ensure the systems could continue to operate after the owner Solar Systems Pty Ltd was placed into administration.
- Selected a renewable energy provider to supply solar power at Nturiya (Ti Tree), Kalkarindji and Alpurrurulam which will collectively save about 440 kilolitres of diesel fuel and 1200 tonnes of greenhouse gas emissions per year.
- Secured funding for a new, full borne gravity sewerage reticulation system for the school, health clinic, community store and administration buildings in Nganmarriyanga (Palumpa) after damage by floodwaters.

Outlook for 2010-11

The Northern Territory Government *Territory 2030 Strategic Plan* and the *Climate Change* and *A Working Future* policy initiatives contain important commitments relating to essential service and infrastructure delivery in remote Indigenous towns and communities, which for IES resulted in planned work associated with:

- The entitlement of remote Indigenous communities to standards of service and infrastructure broadly comparable with those in non-Indigenous communities of similar size, location and need elsewhere in Australia.
- The need to establish a capacity building strategy and program for Essential Services Operators for Territory Growth Towns and communities.
- The replacement by 2020 of diesel as the primary source of power generation in remote towns and communities using renewable and low emissions energy sources instead.
- The development of Community Water Plans in Growth Towns and Remote Communities to ensure the sustainable management of water supplies, including demand management.

The policy initiatives of *Closing the Gap on Indigenous Disadvantage* and the joint Commonwealth and Territory Government's *Strategic Indigenous Housing and Infrastructure Program* (SIHIP) will continue to significantly impact the demand for essential services, with an increased focus on both the capacity and reliability measures of services available.

Demand for both water and electricity is expected to continue to grow strongly as a result of expected population growth as well as various Territory and State initiatives, particularly the SIHIP and Closing the Gap programs, aimed at improving lifestyle and health outcomes which invariably will lead to greater use of energy and water services. Improved prosperity through programs to provide sustainable employment opportunities will also grow the demand for services with embodied energy and water.

Looking forward to 2010 11, IES will:

- Address financial sustainability by maximising revenue consistent with regulatory outcomes and through ongoing roll out of water and electricity meters, expenditure control and efficiency gains.
- Enhance asset management capabilities through successful implementation and ongoing development of the Asset Management Capability project.
- Build organisational capability with a strong focus on occupational health and safety and initiatives to develop the organisation's workforce capabilities, including the improved engagement and training of ESOs.
- Respond to climate change and environmental concerns and policies as included in the Territory Government's 2030 strategy.

Our Business

BELOW ▸ WATER TESTING

In Profile

Power and Water has continuously provided electricity, water supply and sewerage services to Indigenous towns and communities since it was established on 1 July 1987. Since then it has built strong, positive relationships with Indigenous people, communities, traditional owners, land councils and the contractors and service providers that support remote communities.

Indigenous Essential Services Pty ltd (IES), a not-for-profit subsidiary of Power and Water, was established in 2003 to provide electricity, water and sewerage services to remote Indigenous communities. While establishing IES has been important for governance, financial and operational objectives, customers in remote communities continue to identify with Power and Water as the service provider.

In September 2007, the Northern Territory and Australian governments signed a Memorandum of Understanding (MOU) for

Indigenous housing and related services. A key aspect of the MOU is that the Northern Territory Government took over responsibility to deliver essential and municipal services to about 10 000 people in 500 homelands and outstations from 1 July 2008. Generally, recurrent and capital grant funding has been provided directly to homelands and outstations with minimal additional services delivered through IES.

In 2009-10, IES provided services to over 35 000 people in 20 Growth Towns, 52 remote communities and 66 outstations. These services are delivered in extremely variable conditions and in isolated locations with limited local technical support.

A key factor in the successful delivery of these services is the role played by the 131 Essential Services Operators (ESOs) and alternative ESOs living in the community, of whom 37 per cent are Indigenous. ESOs are employed locally by Shire Councils, Indigenous enterprises or private contractors under contract to Power and Water.

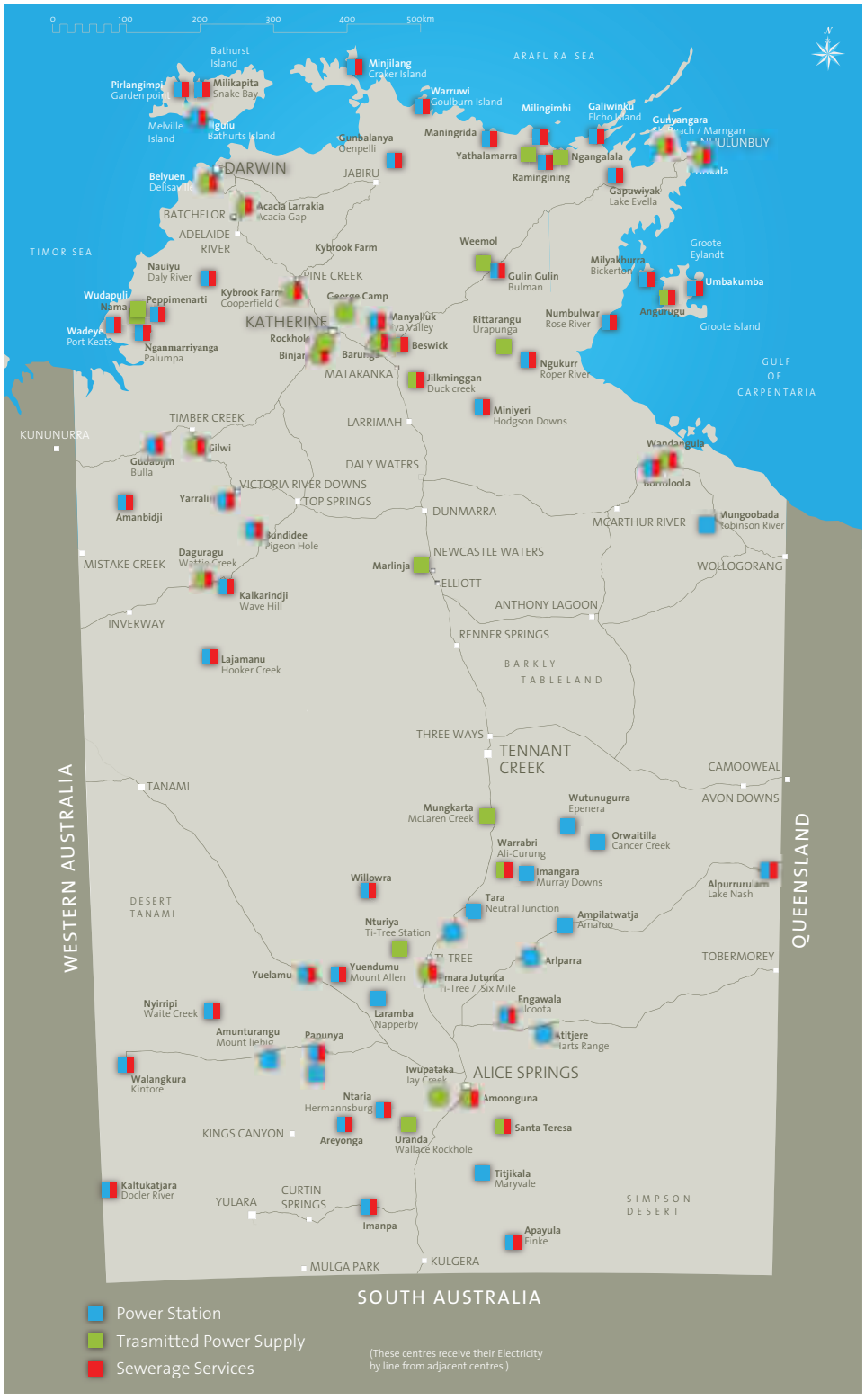
Revenue is collected from the sale of electricity, water supply and sewerage services. The Northern Territory Government funds the delivery of essential services through appropriation to the Department of Local Government, Housing and Regional Services (DLGHRS).

The DLGHRS has an agreement with IES Pty Ltd for the delivery of electricity, water and sewerage services to remote Indigenous communities.

Power and Water's Remote Operations business unit provides management, technical and professional services to IES, supported by the Retail, Power Networks, Generation, Water Services and Strategy and Corporate Affairs business units.

Electricity, water supply and sewerage services are sold to commercial, government and private customers across these locations. Under Northern Territory government policy, Indigenous households pay for electricity, and do not pay for water and sewerage services.

Indigenous communities power, water supply and sewerage services



Retail licences for remote Indigenous communities are not shown on this map.

BELOW ▸ DALY RIVER WATER TANK

Remote Indigenous Communities

ABOVE ▸ DALY RIVER DRILLING

The Northern Territory and Australian governments, through various initiatives aim to improve the lives and health of Indigenous Territorians supported by the delivery of reliable essential services and by increasing Indigenous employment opportunities.

The Australian and Northern Territory governments have articulated in various initiatives, including the *Closing the Gap on Indigenous Disadvantage,* that remote Indigenous communities are entitled to standards of service and infrastructure that are comparable to other Australian towns of similar size, location and need.

The Northern Territory Government released its *Territory 2030 Strategic Plan* as a framework for development in the Northern Territory to provide infrastructure to cater for increased demand from additional housing in 20 of the biggest remote communities, known as Territory Growth Towns. The Growth Towns are Maningrida, Gunbalanya, Gapuwiyak, Ramingining, Wadeye, Milingimbi, Yuendumu, Ntaria (Hermannsburg), Borroloola, Ngukurr, Yirrkala, Papunya, Galiwinku, Numbulwar, Lajamanu, Elliott, Wurrumiyanga (Nguiu), Angurugu/Umbakumba, Daguragu/Kalkarindji and Warrabri (Ali Curung).

Developing the Growth Towns into economic hubs with more services, buildings and facilities can be achieved only with solid infrastructure and adequate essential services, through reliable and sustainable water, sewerage and electricity services.

Sitting within the *Territory 2030* framework is the Northern Territory Government's *Working Future* strategy, of which one goal is to increase Indigenous employment in the Growth Towns. Power and Water has embraced this strategy with a targeted program to boost Indigenous Essential Services Operators in the Growth Towns to help operate and maintain local electricity, water and sewerage services infrastructure.

In 2009 the Northern Territory Government released its *Climate Change Policy* which includes a commitment to replace diesel fuel with renewable and low energy sources as the primary source of power generation in remote communities by 2020. Power and Water is putting in place a plan to meet this target.

Power and Water is committed to protecting our environment and valuable water resources. One initiative to help achieve these goals is Power and Water's *Sustainable Water Management Strategy* which includes developing Community Water Plans in priority Indigenous communities where water supply is under significant pressure. The Community Water Plans are developed and put in place in consultation with the local community to understand and include what they can do to help improve management of the water supply and conservation of the water source. The Strategy also includes greater investment in demand management, groundwater monitoring, licensing and on-ground source management.

Power and Water's *Strategy for Safe Water* was established in 2007 to provide Indigenous communities with water of a quality consistent with the Australian Drinking Water Guidelines by 2011. The strategy works to improve the quality of drinking water in priority communities that face challenges with their water supply.

ABOVE ► PMARA JUTUNTA BORE

Our Operating Environment

ABOVE ▸ JILKMINGGAN SOLAR PANELS

There are seven unique characteristics affecting the provision of essential services to Indigenous people:

Indigenous Population and Population Growth

Rapid population growth in the Northern Territory is predicted to continue at a rate of 14 per cent a year (Australian Bureau of Statistics, 2001; Australian Bureau of Statistics, 2006). Increased investment in housing and infrastructure to keep up with this population growth will put additional pressure on water and electricity supplies and sewerage services.

Indigenous Disadvantage

The relative social, economic and environmental health disadvantage of Indigenous people has limited the ability to apply a user pays policy for water supply and sewerage services.

Remoteness

The remoteness and small size of these towns and communities affects the cost of providing water, electricity and sewerage services, distribution logistics and Power and Water's ability to employ, train and retain technical staff.

Legacy Infrastructure Issues

The legacy of aging infrastructure (of variable standard, often with a shorter life than current design standards) and a history of ill-defined property and housing ownership maintenance presents additional challenges to manage assets.

Cross-cultural Approaches

Cross-cultural approaches to engaging Indigenous communities are needed to better understand community perceptions and use of electricity, water services and sewerage. It is crucial that Indigenous people are involved and have ownership of decision making on appropriate management of resources and defined responses.

Groundwater Reliance

Unique challenges arise from extracting about 95 per cent of drinking water from groundwater across the remote towns and communities. There is limited data available on the size of some of these resources, including information on sustainable extraction. Reliance on local groundwater sources also means relying on the local water quality, and in some areas of the NT it is challenging to find supplies appropriate for drinking water.

Diesel Fuel Reliance

More than 90 per cent of electricity is sourced from community power stations using diesel fuel, leading to significant exposure to diesel price increases and associated transportation costs.

Essential Services

BELOW ▸ ESSENTIAL SERVICES OPERATORS HAVE A CRITICAL ROLE IN REMOTE COMMUNITIES

Electricity Supply

IES supplies electricity to the Northern Territory Remote Communities, predominantly generated by diesel-fired power stations. IES owns and operates 52 diesel power stations, with an installed capacity of 69 megawatts (MW). With over 175 diesel generators installed, ranging in size from 50 kilowatts (kW) up to 1.6 megawatts (MW), IES manages one of the largest 'fleets' of diesel generation plant in Australia.

Additionally, IES purchases electricity for supply to several remote communities from the:

- Power and Water power grid for 14 communities;
- Rio Tinto Alcan Gove power grid for two communities in East Arnhem; and
- GEMCO power grid for one community on Groote Eylandt.

Solar photovoltaic (PV) and Concentrating Photovoltaic (CPV) power also supplements fossil fuel generation at six communities depicted below, with an installed capacity of almost 800 kilowatts (kW). The renewable energy systems utilise a range of solar technologies, including both concentrating dishes and flat plate modules, fixed and tracking arrays and crystalline PV cells and amorphous thin-film PV cells.

Remote Operations also maintains five minor centre power stations on behalf of Power and Water generation with an installed capacity of 8.8 MW and generators ranging from 180 kW up to 1.5 MW.

Power and Water owns and operates CPV solar dish systems in Ntaria (Hermannsburg), Yuendumu and Lajamanu, and flat plate PV systems in Gulin Gulin (Bulman), Jilkminggan and Gudabijin (Bulla).

Power and Water CPV and PV solar power systems in the Northern Territory

Water Supply

Power and Water supplies drinking water from ground and surface water sources to 20 Growth Towns and 52 remote communities spread across the Northern Territory.

The Northern Territory's water supply varies, with communities experiencing different climatic conditions from deserts in the south, to the seasonal contrasts of the wet and dry seasons in the north. Rainfall is vital to recharge aquifers for groundwater supply in all communities but is particularly important in "water stressed" communities where groundwater is limited.

Sixty one communities source their water from groundwater, contained in underground water bodies known as aquifers, which is extracted through production bores. Surface water is sourced from rivers, creeks and dams for six per cent of the communities with freshwater springs supplying Barunga and Pirlangimpi, while Yuelamu draws water from a dam. Another five communities – Gunbalanya, Angurugu, Gudabijin (Bulla), Ngukurr and Mungoobada (Robinson River) – use a combination of surface and groundwater (more detail can be found in Appendix A).

Most water supply systems involve a number of production bores, which pump water from the underground aquifer to a central storage area where the water is disinfected and delivered to consumers via the distribution system using gravity. There are more than 200 production bores that supply drinking water to remote Indigenous communities.

Water treatment processes are used to improve the quality of water supplied to a number of communities. This involves the raw water being treated before being disinfected and distributed to the community. Three different treatment methods are used including filtration, aeration and disinfection (Appendix B).

The water quality at all communities is monitored regularly to ensure that the drinking water supplied is consistent with the Australian Drinking Water Guidelines. Monitoring includes both regular collection of samples to test for microbiological contamination and daily testing for chlorine residual to ensure effective disinfection.

The process and infrastructure involved in providing drinking water to communities can be seen in the figure below.

Process and assets in providing drinking water

Water Source

Typically, water is extracted from underground aquifers via bores. Surface water sources, such as dams, rivers and springs, are used to supply drinking water in a few communities.

Water Storage

The water is then stored in tanks typically consisting of at least one large tank on the ground and a smaller tank elevated on a stand. The water is transferred from the ground level tank to the elevated tank using transfer pumps. Some communities have pressure pumps in place of elevated tanks.

Water Treatment

Typically, water treatment is primarily disinfection, such as sodium hypochlorite, chlorine gas and UV disinfection. Other treatment systems such as sand filters and clarifiers are used in communities that also use surface water sources and PWC is investing in more advance treatment in some communities.

Water Distribution System

Underground pipes and rising mains distribute the drinking water throughout the community to the consumer's taps. Typically, these are gravity systems and are inspected through the man-holes and flushed using water hydrants.

Sewerage Services

Power and Water manages reticulated sewerage services in 56 remote locations across the Northern Territory.

Services are provided in these communities by taking sewage and wastewater off-site through sewer pipes and sewerage pump stations to centralised waste stabilisation ponds for treatment. The collection and treatment of raw sewerage and disposal of effluent (treated wastewater) prevent exposure of the community to raw sewage and minimise risks to public health and impacts on the environment.

The process and infrastructure involved in providing sewerage services are shown in the figure below.

Process and assets in providing sewerage services

Sewerage Reticulation System

Pipes (and rising mains) collect the sewage (or effluent in the case with CED or STEP systems), from the lot boundary and transport it to the SPS or the WSP. Typically, these are gravity systems except with the STEP system.

Sewerage Pump Station (SPS)

Raw sewage (or effluent in the case with CED or STEP systems) is pumped to gravity mains, downstream SPS or WSP. These typically include; concrete pump sump; duty and standby pumps; valves and valve chambers; overflow containment facilities; and System Control infrastructure.

Waste Stabilisation Ponds (WSP)

Treatment of the sewage occurs in a number of ponds (2 7), which retain the sewage (or effluent in the case with CED or STEP systems) to allow the natural biological process to treat the sewage (primarily through facultative treatment).

Treated Discharge

Subsequent to treatment, the final effluent (treated wastewater) is then discharged from the WSP compound via either an irrigated disposal area, or discharged directly into the environment.

Retail

The 2009-10 financial year saw electricity sales of $20.84 million and water sales worth $1.69 million for IES.

All electricity customers pay for electricity at the uniform Power and Water tariff. There is a uniform Power and Water tariff for water and sewerage services. Historically, public housing in remote communities have not paid for water and sewerage services.

In the past year, a user pays policy has been extended to water and sewerage customers, other than domestic Indigenous households in remote Indigenous communities who do not pay for water and sewerage services. Purchasing prepaid power tokens is still the preferred option for domestic customers in Indigenous communities and about 80 per cent of customers use this system.

Power and Water now use wide card prepayment meters. The existing meters were replaced in order to improve service to consumers with a better and more reliable prepayment meter. The new wide card meter looks very similar to the small card meter used previously, with the only obvious difference being the card slot. The small cards (tokens) used previously have been replaced by a credit card sized token. Like the small tokens these will have different values ($5, $10, $20).

Water and Energy Conservation

Water and electricity are needed to meet the most basic of human needs, and so the quality and supply of these vital resources must be protected.

To maintain reliable, cost-effective electricity and water services in remote communities, it is essential to consider efficiencies including conserving energy, managing demand and increasing the efficiency of power and water systems. In addition, with the likely continued increase of diesel fuel prices, energy efficiency measures will become even more important.

Demand for water and electricity in remote Indigenous communities is increasing, along with population growth, greater use of household appliances and more in and outdoor water use. Demand for water on communities will increase as the number of houses increase and people have better access to bathrooms and kitchens. Rapid population growth is expected to continue, resulting in ongoing increased demand.

About one-third of the 20 Territory Growth Towns and one-third of the 52 remote Indigenous communities are "water stressed" which means they have limited water sources and a water consumption pattern which may place their water supplies under threat.

In line with urban initiatives and environmental objectives Power and Water is increasing its focus on water and energy conservation to slow down the increase in demand. Demand management programs aim to reduce demand growth for power and water which might result in deferring further investment in additional water sources and infrastructure.

While water conservation programs in cities and towns have been in place for some time, programs introduced cross-culturally require a different design and implementation, acknowledging the cultural ties between Indigenous people and their land and water.

Power and Water has introduced various water conservation programs specifically in communities where the groundwater source is limited and insufficient to meet daily needs. Power and Water is developing a culturally appropriate approach to energy and water conservation programs.

The approach being developed by Power and Water focuses strongly on sharing cultural stories, education and respectful engagement.

Managing water demand in communities includes initiatives such as improved metering, residential retrofit programs, operational water efficiencies and community supported water conservation programs to change water use behaviour.

Power and Water's approach to conserving water and energy includes working with community members to raise awareness about where water and electricity comes from, how they are used and how to conserve these precious resources.

Strategies such as the *Sustainable Water Management Strategy* include groundwater monitoring, water extraction licensing and measuring water consumption through a metering program.

Benefits of reducing water demand include:

- minimising the environmental impacts of water extraction by reducing wastage of water supplies.
- making additional water available for other community-identified needs.
- reducing the operational costs and cost to government of producing water.
- helping local organisations and businesses save money from reduced water bills.
- deferring capital investment and reducing the high cost of new infrastructure that would be required to cope with unchecked demand.
- reducing energy consumption and greenhouse gas emissions from pumping water.
- providing opportunities to work in partnership with the community.

Working in partnership with the community also leads to more effective programs and local ownership of the initiatives, as well as an improved understanding of essential services performance.

Benefits of achieving energy efficiencies include:

- reducing greenhouse gas emissions with less diesel fuel needed to generate electricity.
- reducing local air pollution.
- reducing the increasing expenditure required of the Northern Territory Government by reducing electricity supply costs.
- reducing the amount of money residents spend on electricity to free up household income for other necessities.
- improving environmental health.
- reducing or deferring capital investment in generation capacity, particularly peak generating capacity.

Improving Our Systems

BELOW ▸ ESO FAMILIARISATION COURSE, DARWIN

Power Generation

Power and Water is committed to increasing energy efficiencies and to making the transition from mainly diesel generated electricity to increase renewable and low emissions energy sources by 2020. To achieve these goals Power and Water is expanding its solar energy technology and continuing to improve the efficiency of existing power generation systems.

The *Energy Source Strategy for Growth Towns and Indigenous Communities* is a strategy for the long-term provision of reliable, cost-effective power in remote communities. The strategy is underpinned by an economic assessment of available energy options for each community. Objectives of the strategy are to:

- minimise long term service delivery costs.
- meet community demand growth.
- make efficient use of emerging technologies and the availability of gaseous fuels.
- prepare for the financial impacts of climate change.

In 2009-10 Power and Water started work on various energy source projects recommended by the *Energy Source Strategy*, including:

New Natural Gas-fired Power Station at Wadeye

- Electricity demand at Wadeye has increased rapidly over recent years and is expected to continue to increase. The capacity of the existing power station is no longer adequate to meet future demand. The power station is more than 30 years old, poorly located in the centre of town and has reached the end of its economic life. Planning for the construction of a new gas-fired power station at a new location away from town has started, with the gas supply to come from the Bonaparte Gas Pipeline.

Renewable Energy at Nturiya (Ti Tree), Kalkarindji and Alpurrurulam (Lake Nash)

- In the *Climate Change Policy* released in 2009, the Northern Territory Government has committed to showcase renewable energy across the three communities of Nturiya, Kalkarindji and Alpurrurulam. The project, which went out to tender in late 2009, will see 1 megawatt of solar power installed under a Power Purchase Agreement with a renewable energy provider. Construction is set to begin in 2011.

Yuelamu Regional Electricity Grid Connection

- The power station at Yuelamu, 290km north-west of Alice Springs, was decommissioned and a 44km power line was built from the remote community to nearby Yuendumu. The alternative would have included construction of an entire new power station, at an estimated cost of $600 000 at Yuelamu. The project also involved the removal of fuel storage that did not meet current fuel bunding standards.

Energy Efficiency

- Improving the efficiency of remote power stations is a key part of Power and Water's ongoing operations. Station efficiency varies depending on size, age and technology. The Power and Water operating philosophy is to upgrade to newer technologies as generator plant reaches the end of its economic life and rotate generator plant between communities to ensure appropriate sizing is maintained to suit load growth. Station thermal efficiency data is analysed regularly to determine where efficiency gains can be achieved.
- A new power station at Gulin Gulin (Bulman) was commissioned in September 2009, supplementing solar power for the communities of Gulin Gulin and Weemol, about 300km west of Katherine. The new $1.5 million power supply saw three new generators at Gulin Gulin and Weemol increase efficiency by three per cent and save 6000 litres of diesel each year – equating to about 16 tonnes of carbon dioxide equivalent emissions. The new power station has an airconditioned control room and an increased fuel storage facility of 190 000 litres of diesel fuel.

Maintaining a Reliable Electricity Supply

A new power station was completed at Willowra with its fuel storage facility increased to 100 000 litres to better deal with potential isolation during heavy rainfall. The Yilpara power station was upgraded with the installation of two new Hino generating units and a new switchboard.

Fuel Delivery on Target

Diesel is the primary source of fuel for the power stations run by Power and Water in the remote communities in the Northern Territory.

The supply and delivery of diesel to the remote locations across the northern and southern regions is a major feat in logistics.

In 2009-10 a total of 29.72 million litres of diesel fuel was transported to power stations across about 1 million kilometres in the Northern Territory at a cost of $23.89 million.

Fuel is transported from the Vopak Common User Terminal in Darwin, with diesel taken by barge to the coastal communities in the Top End and by road to all other communities. Fuel delivery can take as long as one week to arrive in remote communities by barge from Darwin, so the timing and the amount of fuel stored is crucial.

In the wet season a proportion of the communities serviced can be cut off for many months as heavy rain reduces road access.

Power and Water works closely with the contracted fuel supplier to overcome the tyranny of distance, making sure the right amount of fuel is delivered at the right time and in the most cost-effective way.

Darwin Region

Darwin region had 16.80 million litres of diesel delivered at a cost of $13.72 million in 2009-10. Power stations in the Darwin region needed 540 orders for diesel with an average delivery of 31 000 litres.

For coastal communities in the Darwin region the quantity of fuel deliveries depends on the capacity of the barge and the weight of other freight. Only four communities in the Darwin region receive diesel deliveries by road – Peppimenarti, Gunbalanya, Nganmarriyanga (Palumpa) and Nauiyu (Daly River). Gunbalanya can be cut off for many months of the year due to heavy rain reducing road access and to ensure electricity supply, Power and Water has increased fuel storage to 1.07 million litres.

Katherine Region

A total of $3.67 million was spent transporting 5.06 million litres of fuel to power stations in the Katherine region.

Road access can be cut to many of the power stations for at least six months of the year, which resulted in 92 orders of diesel needed to deliver 64 000 litres per order.

Power stations in the Katherine region receive most of their fuel stockpiles in the dry season as after November many communities are cut off until April or May the next year. For example, Mungoobada (Robinson River) can be inaccessible up until July and then closed again as soon as September in the same year, requiring 48 week's worth of fuel storage.

In 2009-10 the Katherine region was affected by Cyclone Paul, which resulted in limited road access to Gulin Gulin (Bulman) and Ngukurr. A dry period in January and February in 2010 had allowed enough fuel to be delivered to last until the next delivery in May. The cyclone damaged some power lines in Ngukurr but the Essential Services Operator re-routed power safely until Power and Water staff could get on site and make repairs.

Southern Region

In 2009-10 a total of 7.86 million litres of diesel was delivered at a cost of $6.50 million to the southern region.

The easier it is to access the power station, the less fuel needs to be stored on site. The southern region needed 248 orders to deliver 7.4 million litres of fuel with an average delivery of 30 000 litres per order.

Dry conditions in the southern region mean that communities are not usually cut off for extensive periods of time, and when cut off it is often for less than a week.

Fuel stocks are therefore kept at a four to five week supply to prevent fuel running low. In 2009-10 higher than usual rainfall in the region caused delays to fuel deliveries and Yuendumu was close to running out of fuel. Quick action to salvage fuel from a nearby decommissioned fuel station meant the fuel made it to the community in plenty of time and there was no impact on the generation of electricity.

Water Sustainability

Water is essential to maintain good health and hygiene in remote Indigenous communities. Power and Water is committed to improving water access, availability and management in collaboration with local communities. The *Sustainable Water Management Strategy* provides an action plan to improve the security and responsible use of water resources across Indigenous communities to help meet domestic and development needs for water into the future.

Some of the objectives are to:

- improve security and responsible use of water resources.
- develop Community Water Plans in priority communities to work with residents to understand community-led actions to conserve water and better manage the water supply.
- develop and refine community engagement methods to work better with residents and stakeholders.
- collaborate with town planning for Growth Towns under the Northern Territory Government's Working Future policy to inform water-appropriate developments.
- understand the sustainability of water sources through source assessment and groundwater monitoring.
- meet reporting and regulatory requirements under Northern Territory and national water agency regulatory reporting frameworks.
- analyse commercial, government and residential customer water consumption trends.
- design demand management actions for target communities experiencing water stress.

Power and Water aims to incorporate community needs and aspirations in sustainable water management to improve water service delivery. The development of Community Water Plans is an opportunity for residents to be more directly engaged in the sustainable management of their own water supply.

Monitoring Demand in Remote Communities

Monitoring water consumption in communities is very important as it helps Power and Water understand water use and if the water supply is sustainable. As Indigenous households do not pay for water, most households do not have a water meter installed. It is therefore difficult to define the consumption

by household or by person. Water meters provide information about the water used which can be used for charging for water or for statistical purposes.

The bulk total water production figures, which are measured daily, are divided by total population to give a township demand, compared across communities as "litres per equivalent persons per day" (L/Ep/D). This figure accounts for all water used across the township or community including watering of public space, building and road maintenance, commercial and industry usage. The figure can also be used to detect anomalies in water use such as major leaks.

Power and Water has water meters installed in remote communities to charge for usage and monitor water for commercial and government properties only. These consumers consist of schools, shops, health clinics, police, government buildings and staff housing, which are billed according to Northern Territory-wide uniform Power and Water tariffs.

Power and Water metering data shows that across the 20 Growth Towns and 52 remote communities, non-residential water users accounted for 17 per cent of water demand in 2009-10. The majority of water consumption is within households, as well as some losses and operational usage (including flushing pipes).

Indigenous housing is not individually metered in the majority of communities and indigenous households are not charged for water. For research and development purposes, water meters have been installed in Indigenous households on four communities with a history of water stress: Gunbalanya, Minyerri, Santa Teresa and Yuelamu.

Water consumption varied widely in the 2009-10 year across all communities ranging from 138 litres per equivalent persons per day (L/Ep/D) to 1836 L/Ep/D. The Indigenous Community Engineering Guidelines (PWC 2008) recommend that remote communities' water systems be able to cater for a peak daily demand of 1200 L/Ep/D and an average daily demand of 800 L/Ep/D.

The difference between expected and actual water use can be caused by the lack of quality data and poor data collection, poor housing water infrastructure, inefficient water behaviours, aged or damaged water supply infrastructure, small water thirsty enterprises and inefficient maintenance of parks and ovals. Populations can also vary seasonally or in response to events from high mobility which can result in a much higher number of people living in the community temporarily and therefore spikes of higher water use.

A detailed summary of the water consumption for each community serviced by Power and Water can be found in Appendix A.

Improving Security and Reliability of Water Supply

The Australian Government has allocated $20.25 million to improve the security and reliability of the water supply in five remote communities identified as Growth Towns in the Northern Territory. The funding is part of a $51.7 million package to upgrade water supply and wastewater infrastructure for 18 projects in 17 communities across Australia.

The funds are to be used for treatment facilities, increased water storage capacity and replacement of water supply systems and will be spent in Galiwinku, Angurugu, Umbakumba, Wurrumiyanga (Nguiu) and Wadeye.

Improving Supply and Quality

The communities of Daly River, Lake Nash and Beswick have better access to a safe and reliable water supply after successful drilling programs this year found new water sources.

Power and Water actively works in Indigenous communities that are identified as "water stressed" to investigate alternative water supplies. A community is considered water stressed if the groundwater supply is limited. A water bore drilling program is based on a community's need, current water quality, supply, demand and sustainability of the existing water source.

A drilling program was undertaken to increase supply and quality of water to the community of Nauiyu (Daly River), which has a population of 630 people and is about 300km north-west of Katherine. The community currently sources its drinking water from groundwater but also uses water from the nearby Daly River to irrigate public places. The existing groundwater supply is limited and suffers from elevated iron, creating issues with the quality of supply. The current bore field is also often inundated with flood water for most of the wet season which prohibits effective operation and maintenance.

Five production bores were constructed and each one returned good results, with extraction rates ranging from two to five litres per second and little indication of iron or other water quality issues. Two bores were finished for long-term monitoring.

Power and Water confirmed the existence of a new water source for the growing community of Alpurrurulam which has a population of 730 and is about

650km north-east of Alice Springs. Water is currently drawn from bores about 2km from the community, but it is affected by high fluoride levels. Eight monitoring bores were constructed, containing high quality water, with extraction rates of up to 25 litres per second. A drilling program is now planned to drill for production bores.

Two new production bores have been drilled to establish an alternative water source in the community of Barunga, 90km south-east of Katherine. The small community of 320 people is supplied with water by a spring which is susceptible to bacterial contamination. The two new bores will provide additional water and reduce any potential risk to the existing water source. The two bores have a yield of four litres per second.

Power and Water has awarded contracts to provide professional hydrogeological expertise to increase water supplies in several Growth Towns. This will result in drilling, construction and testing of new investigation and production bores to ensure water supplies meet the growing demand for water, especially with the construction of new houses under the Strategic Indigenous Housing Infrastructure Program.

Managing Water Resources

Power and Water continues to manage ground and surface water resources through water extraction licensing and an extensive groundwater monitoring program. Power and Water requires a licence for the extraction of water within a Water Control District – any area proclaimed by the Department of Natural Resources, Environment, the Arts and Sport (NRETAS) as needing closer management of the water resources. (For details on water extraction licensing details go to Appendix C). Groundwater monitoring is required as part of these licenses in some locations, and a greater monitoring effort is conducted to understand the sustainability of our water sources.

Power and Water Remote Operations currently holds 18 water extraction licences and is working with NRETAS on 15 more licences. Water Control Districts have been declared in the Darwin Rural District, Gove Peninsular, Daly Roper, Tennant Creek, Nturiya (Ti Tree), Alice Springs and the Great Artesian Basin. Outside of these areas a licence is required where a bore pumps more than 15 litres per second or where any surface water extraction occurs for non-stock and domestic purposes. Power and Water extracts surface water from rivers, dams, lakes and creeks to meet water use demands of remote communities.

The communities of Gudabijin (Bulla) and Ngukurr went over their surface water extraction limits in 2009-10. Power and Water is working with NRETAS to reduce water consumption in these two communities as well as find new water sources or increase the surface water extraction licences.

A balance of ground and surface water (from the East Baines River) is supplied to the community of Gudabijin (Bulla). The licence limit breach occurred when a larger than expected volume of water was extracted from the river after less groundwater than expected was supplied to the community.

Ngukurr relies on both ground and surface water and recently experienced a drop in groundwater quality, possibly due to over extraction. Power and Water is currently investigating alternative supplies for Ngukurr to greatly improve the water quality and reduce reliance on surface water.

Power and Water is working with stakeholders including the Bureau of Meteorology to monitor the aquifers supplying remote communities in the Northern Territory. Investment from the Bureau has funded part of the groundwater monitoring program, which has already seen 24 electronic water level stations installed to monitor aquifers supplying 12 remote communities as part of the Bureau of Meteorology's Modernisation and Extension program. At its completion, the $1.1million project will monitor groundwater which provides 34 community water supplies.

Increasing Efficiency to Save Water

Power and Water is continually working to increase the efficiencies of water supply systems and help save water.

Appropriate management of bore field operations is one way to make the system more efficient. One initiative implemented to save water this year was to regularly clean bores in communities where iron bacteria is an issue. Iron bacteria forms on the inside of bores and mobilises in stationary water inside the water pipe. The iron settles and builds up, leaving the water with an unpleasant taste and discolouration that stains clothes.

Previously, the best way to deal with iron in the water was to flush the standing water in the system and dump the iron-stained water, resulting in large water losses. Cleaning the bore reduces the need for flushing and can result in large water savings in water stressed communities.

The second Power and Water initiative to save water and increase efficiency of its systems is the introduction of a new Supervisory Control and Data Acquisition (SCADA) automated control system for bore fields. The SCADA system can better manage water systems including tank levels and bores, leading to less tank overflows and water loss.

About 120 million litres of water will be saved each year in Wurrumiyanga (Nguiu) after a SCADA computer monitoring and control equipment was installed to detect when storage tanks are full and automatically shuts off bores to prevent overflows.

The new control system is operated by an Essential Services Officer from a computer stationed at the Wurrumiyanga power station and can control which bores, valves and storages are used without travelling to different locations, which can be more than 10km away.

Before the installation of the SCADA automated control system, one-third of water produced in Wurrumiyanga was lost during production. This was due to the large distance of the borefield from the community and the ineffectiveness of traditional overflow technologies over these distances. This investment will pay for itself in saved water costs after the first 13 months.

Water Quality

Over the past couple of years, Power and Water has worked to implement a multiple barrier approach to prevent contamination and minimise potential hazards in order to provide safe drinking water to residents. This approach is based on the 2004 Australian Drinking Water Guidelines (ADWG), and includes:

- protecting catchments.
- ensuring tanks and bores are sealed to prevent contamination.
- water treatment and disinfection of water.
- maintaining chlorine residuals through water distribution systems.

Chlorine is used as a disinfectant and a low level of chlorine helps to keep the water safe throughout the reticulation system. The drinking water is regularly tested to ensure that the chlorine residual is in the optimum range – high enough to combat any microbiological contamination but low enough to still be drinkable.

Protecting and Monitoring Water Supplies

Power and Water runs an extensive Drinking Water Quality Monitoring Program to make sure the processes and infrastructure in place to protect and enhance water quality are working, to verify the quality of water provided to consumers, to increase understanding of a water supply system to identify hazards, and to increase its knowledge of the systems. The Drinking Water Quality Monitoring Program is developed and reviewed in consultation with the Department of Health and is approved by the Chief Health Officer in accordance with the Australian Drinking Water Guidelines.

More than 7500 water samples were taken in 2009-10 from water sources, treatment plants and water distribution pipe networks which supply customers. Analytical laboratories contracted by Power and Water performed 90 500 analyses to determine microbiological, physio-chemical, trace metal and radiological characteristics of the water. For more detail on the water quality characteristics that are tested, go to Appendix D.

Reporting Water Quality Related to Health

Power and Water is finalising a Memorandum of Understanding with the Department of Health for managing drinking water quality in its area of control. This memorandum will replace the Drinking Water Reporting Triggers and Protocol previously in place.

The Memorandum outlines the actions that need to be taken when water tests identify issues including when E. coli is detected in the distribution system as part of the Drinking Water Quality Monitoring Program. In some instances, the Department of Health will take an extra protective step and issue a Precautionary Advice for Drinking Water to advise the community that drinking water should be boiled before consumption.

During 2009-10, positive E. coli detections did occur in Angurugu, Gunbalanya, Ramingining, Ngukurr, Titjikala, Weemol, Walangkura (Kintore), Laramba, and Yuelamu. Of these detections, only one, at Angurugu, indicated a significant risk to public health and the Department of Health issued a Precautionary Advice for Drinking Water. Additional information on this incident, including immediate responses, investigations and improvements are provided in the table on the following page.

A second Precautionary Advice for Drinking Water alert was issued for Numbulwar in March 2010 after Ex-Tropical Cyclone Paul (see table on following page). In both instances Power and Water staff were able to return the drinking water quality within 24 hours to meet the recommendations of the ADWG.

Incidents Resulting in Precautionary Advice for Drinking Water in 2009-10

Community	Date of Issue	Incident Details
Angurugu and Alyangula	24 December 2009	Significant levels of E.coli were detected in Angurugu's water supply. As Alyangula's water supply comes from the same source as Angurugu's, the water boil alert was extended to Alyangula as a precaution. Power and Water, in conjunction with GEMCO who manage the water treatment system, undertook an inspection to identify the source of contamination and increased chlorine disinfection levels. The system was comprehensively flushed to remove potentially contaminated water. Analysis of additional water samples confirmed the water was clear from E. coli and other indicator bacteria and the Department of Health lifted the Precautionary Notice on 25 December 2009.
Numbulwar	30 March 2010	Due to winds and heavy rain from Ex-Tropical Cyclone Paul, the power supply to the community failed and localised flooding prevented Power and Water from maintaining the chlorine system and ensure the safety of the water supply. When the weather eased and access was restored Power and Water manually added chlorine to the water supply system until the automatic chlorinator was reinstated and when adequate chlorine residual levels were achieved, the Department of Health lifted the Precautionary Notice on the 31 March 2010.

Managing Wastewater

Reliable and adequate wastewater collection, treatment and disposal infrastructure is necessary to minimise the risk to public health and the environment. This must occur while complying with the Department of Health and Department of Natural Resources, Environment, the Arts and Sport (NRETAS) regulations.

Power and Water is developing a Wastewater Management Strategy to strategically improve wastewater treatment systems in 56 of the Northern Territory's Growth Towns and remote communities by 2016.

The strategy will give direction on managing wastewater, including guidelines on design, management, commissioning and ownership of the technology, public health issues, energy requirements, maintenance and security of assets, monitoring, approvals and stakeholder engagement. Historically, Power and Water has focused on the operation of wastewater systems and there are significant legacy infrastructure issues, especially with pollutant discharges into the environment.

To manage the operation of wastewater systems, treated effluent sometimes needs to be discharged. Under the *Water Act* any discharge must be authorised by the Controller of Water Resources, who issues a Waste Discharge Licence. Angurugu is the only remote community that currently has a Water Discharge Licence, which was issued in 2008.

The first steps of the Wastewater Management Strategy include gathering information from current systems, assessing the risks to prioritise systems and implement improved operational maintenance programs.

Community Consumption 2009-10

Community	Population Bushtel (2009/10)	Equivalent Average Per Capita Consumued (L/eP/D)	Bulk Consumption (ML/year)
Northern Region			
Acacia	90	563	18
Ali Curung*	411	1274	191
Alpurrurulam (Lake Nash)	410	823	123
Amanbidji	91	713	24
Amoonguna	332	550	67
Ampilatwatja (Amaroo)	463	148	25
Angurugu*	986	823	296
Areyonga	299	253	28
Atitjere (Harts Range)	212	532	41
Barunga	335	1084	133
Belyuen	209	938	72
Beswick	465	960	163
Binjari	230	404	34
Bulla (Gudabijin)	128	838	39
Bulman	155	958	54
Canteen Creek (Orwaitilla)	135	934	46
Daguragu*	258	1161	109
Daly River (Nauiya Nambiyi)	474	551	95
Engawala (Alcoota)	221	167	13
Eva Valley	164	1156	69
Finke (Aputula)	243	708	63
Galiwinku*	2052	807	604
Katherine Region			
Gapuwiyak*	1071	411	160
Gunbalanya (Oenpelli)	1054	737	284
Haasts Bluff (Ikuntji)	148	542	29
Hermannsburg (Ntaria)*	672	442	108
Imangara (Murray Downs)	216	158	12
Imanpa	176	252	16
Jilkminggan	330	490	59
Kalkarindji*	389	1014	144
Kaltukatjara (Docker River)	427	357	56
Kintore	418	428	65
Kybrook Farm	74	997	27
Lajamanu	798	766	223
Laramba (Napperby)	297	265	29
Maningrida*	2463	471	424
Marngarr	276	1146	115
Milikapiti	454	1350	224
Millingimbi*	1083	515	204
Milyakburra (Bickerton Is.)*	130	586	28
Minjilang	323	741	87
Minyerri	533	374	73

Southern & Barkly Region			
Mt Liebig (Aemunturangu)	328	410	49
Nguiu (Bathurst Island)*	1519	798	442
Ngukurr (Roper River)*	1090	1020	406
Nturiya (Ti Tree Station)	317	135	16
Numbulwar*	803	709	208
Nyrippi	301	373	41
Palumpa	402	1019	150
Papunya*	359	830	109
Peppimenarti	215	1790	140
Pigeon Hole	199	63	5
Pirlangimpi (Garden Point)	442	849	137
Pmara Jututa	278	181	18
Ramingining*	785	684	196
Rittarangu (Urapunga)	88	1230	39
Robinson River (Mungoobada)	147	857	46
Santa Teresa	656	626	150
Tara (Neutral Junction)	45	974	16
Titjikala (Maryvale)	261	440	42
Umbakumba*	414	1047	158
Wadeye (Port Keats)*	1954	558	398
Wallace Rockhole (Uranda)	106	877	34
Warruwi	456	762	127
Weemol	82	1011	30
Willowra	326	488	58
Wilora	115	294	12
Wutungurra (Epenarra)	234	317	27
Yarralin	279	344	35
Yirrkala	830	982	298
Yuelamu (Mt Allan)	258	213	20
Yuendumu*	825	524	158
Major Centres			
Batchelor	718	1408	369
Mataranka	400	575	84
Timber Creek	600	450	99
Adelaide River	190	1507	104
Darwin	150,000	760	41808
Pine Creek	450	1512	248
Katherine	9800	933	3333

**denotes Growth Towns*

Major Achievements

ABOVE ▸ LAJAMANU SOLAR DISHES

SIHIP and Essential Infrastructure Requirements

As part of the National Partnership Agreement on Remote Indigenous Housing, the Commonwealth and the Northern Territory have developed the Strategic Indigenous Housing and Infrastructure Program (SIHIP). SIHIP is expected to deliver the construction of new houses, rebuilds of existing houses and refurbishments as well as essential infrastructure to support new houses. Also improvements to living conditions across 72 remote Indigenous communities and a number of community living areas (town camps) in the Northern Territory.

The progression of the infrastructure work is essential for the delivery of houses and has a tight timeframe. The provision of land servicing and essential services (electricity, water and sewerage) is necessary to provide healthy and functional housing in Territory communities as well as to support business developments requiring essential services.

To manage this program of works, the Infrastructure Delivery Team (IDT) has been established in the Department of Housing, Local Government and Regional Services (DHLG&RS), and has key Power and Water staff embedded in the project team. The utility assets will transfer to IES Pty Ltd as gifted assets or capital grants once completed.

Electricity

Energy Source Strategy

In 2010 Power and Water began revising the *Energy Source Strategy* to include a 10-year plan to transition away from diesel generation as the primary source of energy generation to renewable and low emissions energy sources by 2020, in line with the Northern Territory Government's *Climate Change Policy*. Work on various energy source projects in 2009-10 towards delivering on this target included:

- planning for the construction of a natural gas pipeline to Wadeye from the Bonaparte Gas Pipeline and a new gas-fired power station for Wadeye.
- planning for LPG substitution program for selected communities.
- developing regional grid interconnections and power station energy efficiency improvements.
- expanding the Power and Water solar energy generation fleet.

Investing in Solar Dish Technology

Power and Water took over ownership of solar dish power stations in three remote communities in 2009-10 after the previous owner Solar Systems Pty Ltd went into administration.

Power and Water now operates the solar dish power stations, which use concentrating photovoltaic (CPV) technology, in the communities of Ntaria (Hermannsburg), Lajamanu and Yuendumu. Since acquiring the CPV systems Power and Water has been working to optimise the performance of the systems and develop an internal capacity to work with the unique CPV technology.

After agreement with the Central Land Council and consultation with respective traditional owners the site leases were transferred to Power and Water.

Move to Wide Card Meters

A $1.5 million, three-year program to replace all existing Small Card Prepayment Meters with Wide Card Prepayment Meters was completed in 2010.

The new wide card meter looks very similar to the small card meter with the only obvious difference being the card slot. The function of the meter and rates are identical along with the display and its operation.

The existing small cards (tokens) have been replaced by a credit card-sized token. Like the small tokens, these will have different values ($5, $10, $20). For easy identification, the new meter has a mechanical and electronic reader, which will punch marks in the token to say that it has been used.

Customer feedback about the new wide card meter has indicated a smooth transition to new technology for Power and Water customers. Purchasing prepaid power tokens is still the preferred option for domestic customers in Indigenous communities and about 80 per cent of customers use this system.

Cyclone Affects Communities

Essential Services Operators and Power and Water had to respond to damage to power networks and disruption to fuel supply as communities were hit with bad weather and flooding , in the wake of Tropical Cyclone Paul in March 2010.

Power networks were affected in communities across East Arnhem Land including Numbulwar, Weemol, Ngukurr, Gulin Gulin (Bulman) and Milyakburra (Bickerton Island).

Road access to Gulin Gulin and Ngukurr was cut off by the heavy rains but a dry period in January and February in 2009 had allowed enough fuel to be delivered to last until the next delivery in May. There was some damage to power lines in Ngukurr but the Essential Services Operator re-routed power safely until Power and Water could get on site.

Water Supply

Aquifer Storage Recovery

Power and Water this year conducted preliminary planning into reinstating an Aquifer Storage and Recovery (ASR) scheme for drinking water supply in Warruwi. The community of about 400 people is on Goulburn Island about 300km north-east of Darwin. The ASR program involves pumping good quality drinking water from a shallow aquifer which overflows in the wet season, into a deeper storage aquifer which holds lower quality water.

The principle of the scheme is that the fresh water is injected into the aquifer where minor mixing occurs between differing water qualities. The good quality water stays mostly separate from the lower quality water, and can be stored in the

BELOW ▸ TELEMETER BORE

aquifer for long periods. Water of potable standards can then be recovered at a later date, in this case in the late dry season when the shallower groundwater sources are becoming scarce.

Previous trial investigations estimate 75 per cent of injected water is recoverable, while 25 per cent is lost due to mixing with saline water.

Warruwi was chosen for a trial program many years ago because it is the perfect location for ASR as wet season rainfall produces abundant water in bore fields. During the dry season this water flows overland and is lost to evaporation and the ocean. Warruwi is also suitable because it has a deep confined sandstone aquifer that is capable of storing excess water from the overflowing shallow bore fields. ASR requires both excess water for storage and a confined aquifer capable of storing the excess water.

Research estimates an additional 17 per cent of the current water supply could be extracted from the ASR in the dry season. The projects reinstatement involves design and construction of pumping systems, pipe works and online control systems. The complexity of the reinstatement project required substantial background research and planning in 2009-10.

Monitoring Groundwater Resources

The aquifers supplying water to 12 remote communities in the Northern Territory are being monitored continuously with 28 groundwater monitoring stations. The project is jointly funded by Power and Water and the Bureau of Meteorology's Modernisation and Extension program.

The monitoring stations consist of automated electronic data loggers sitting inside monitoring bores, with a power source and telemetry box on top. The loggers continuously monitor the Standing Water Level (SWL) of the groundwater in that bore. Combined with data from a network of other bores, and information about the aquifer properties and size, this measurement can help to estimate the volume of water stored inside the aquifer. The standing water levels recorded can also be used to monitor the possible effects of extracting water for community water supply and how prolonged wet or dry periods impact the overall availability of water in the aquifer.

The project has prioritised water supplies to receive the monitoring. There are two types of monitoring station. The first is a manual download site consisting of a logger inside a bore, which requires a site visit to retrieve data, and the second is a telemetered site which can be solar powered and automatically transmits the data to a central receiver located at the community power station without requiring a time-consuming site visit.

The data loggers have already provided Power and Water with a clearer picture of the interaction between rainfall events, aquifer storage levels and the impact extraction has on the community supply over the short time they have been installed. A map of groundwater monitoring installation sites can be seen in Appendix E.

Three New Water Treatment Systems

Some ground water sources in Central Australia have naturally high levels of elements such as fluoride, nitrate and total dissolved solids, which affect the quality of the potable water supplied to the community.

In order to improve the water quality and security of the water supply advanced water treatment plants will be constructed for Warrabri (Ali Curung), Walangkura (Kintore) and Yuelamu.

The treatment systems will reduce levels of nitrate and fluoride as well as salinity and hardness. Once installed, the drinking water supply for these three communities will be within the recommended levels of the Australian Drinking Water Guidelines.

Yuelamu has a limited drinking water supply from a local surface water source and treating the groundwater to Australian Drinking Water Quality standards will increase the security of supply. The quality of the potable water supply at Warrabri and Walangkura will be improved with these treatment systems.

Construction of the advanced water treatment plants will begin in early 2012 which should see higher quality water supplied in 2012.

Disinfection Systems Upgraded

In the past year Power and Water has introduced new technology to upgrade manual disinfection systems for water supplies in remote communities.

New liquid chlorine systems are being installed to provide a greater level of confidence in the quality of water supplied, significantly reduce the risk of microbiological contamination affecting residents and optimise the operation of the water systems.

To ensure the quality of the drinking water, liquid chlorine residue can be easily monitored to make sure it is in the optimal range – high enough to protect from microbiological contamination but not above the water threshold to be drinkable.

Ten liquid chlorine and four ultra-violet disinfection systems were installed in 14 communities between 2008 and 2009. A further 16 liquid chlorine systems are expected to be installed between 2010 and 2011, with completion expected by December 2011.

Water Metering Program

Historically, as domestic customers on remote communities do not pay for water consumption, water meters have not been installed at individual households.

However, in order to better understand where water is used within the communities and to target water efficiency and demand management programs, Power and Water has begun a program to install water meters across all remote communities.

By the end of 2009-10 financial year Power and Water had installed water consumption meters in about 75 per cent of all commercial and government customers in remote communities.

An exciting trial using "smart meters" that can automatically detect water leaks using a combination of computer software and data collectors began in the small community of Santa Teresa, 85 km from Alice Springs.

The smart meter trial will help manage the delivery of water by monitoring large users or continuity of water flow to identify leaks. The smart meters will be installed at 150 locations in the community that will provide daily meter readings remotely, replacing the need to check each one manually. The meters will relay data each day to a central collection point at Power and Water's regional centre in Alice Springs.

The trial will allow Power and Water to track water usage within the community to identify house repair and reticulation priorities and develop a clear picture on demand management measures and general consumption patterns.

Information from the smart water meters will also help community residents to monitor and manage their water consumption.

The information received from the meters will also provide valuable consumption data for the Power and Water's community water planning team, which will in time work with the community to develop a water plan and hopefully conserve water and power for the whole community.

Communities Help Conserve Water

Power and Water acknowledges the important cultural connections between Indigenous people and their land and water and is developing programs to work with the community through relationships with key custodians, senior land owners and government.

A Community-based Social Marketing (CBSM) research technique was used to research likely barriers to, and benefits of, a planned education campaign for Indigenous communities. The technique identifies the barriers to water and energy conservation through seeking resident input in focus groups and consultations and looks at the barriers to changing environmental behaviours, such as reporting a leaking tap, or using airconditioners in more efficient ways and teaches PWC staff how residents perceive the barriers and benefits to conserving energy and water.

The outcomes defined a need to:

- increase community knowledge and awareness about the true value of water and its limited nature.
- help educate the community on the connection between the water resource and an individual responsibility to manage consumption.
- foster positive behaviour and attitudes to conserving water in significant community groups and organisations.
- help community residents better manage water and power consumption by providing good information in an accessible and culturally appropriate format to residents.

The regional information will be analysed for similarities and differences before being incorporated into the Territory-wide campaign to break down identified barriers to conserving water and provide tools for the community to make positive changes to their behaviour.

A tailored pilot energy and water efficiency campaign was designed to begin in the 2010-11 year, starting with a general media and marketing campaign to raise the level of awareness and education around energy and water use within three priority communities.

Sewerage Services

Upgrade for Nganmarriyanga (Palumpa)

The planning has commenced for a $1.4 million upgrade of the sewerage service for Nganmarriyanga with construction to start in late 2010.

The upgrade will involve replacing septic tanks and septic tank pumping systems with conventional reticulated sewerage.

The project will provide sewerage to key facilities including the school, clinic, store and council offices.

Remedial works were completed after wet season flooding in early 2009 caused problems with septic tanks and pumping systems in the older area of the community.

A total of 39 septic tanks and 26 pump wells were pumped and the sullage waste disposed of, with some septic tanks raised above ground level to prevent flood waters getting in, and old disused septic tanks were decommissioned.

ABOVE ▸ PALUMPA SEWERAGE UPGRADE

In Our Community

Power and Water is working with the Australian, Northern Territory and local governments to improve the lives of people in remote communities through the National Partnership Agreement on Remote Service Delivery and Strategic Indigenous Housing Infrastructure Program.

In 2008 the Australian Government announced a 10-year $5.5 billion program to improve residential and commercial infrastructure in Indigenous communities to deliver facilities and services similar to those that could be expected in any Australian town of the same size.

The Northern Territory Government's *Working Future* strategy identified 20 of the biggest remote communities as Territory Growth Towns that are to be provided with additional services, buildings and facilities.

The strategy set a six-part plan to develop the 20 Territory Growth Towns, set a new path for homelands and outstations and coordinate the delivery of improved infrastructure, services and development. It is a long-term, generational commitment based on delivering coordinated, targeted and accelerated development in Indigenous communities and changing the way governments invest in remote areas.

This approach is being put into place by developing Local Implementation Plans in the 20 remote Indigenous communities identified below as Territory Growth Towns under the *Working Future* policy.

Two of the Growth Towns, Borroloola and Elliott are serviced directly by Power and Water, and not through IES, and are therefore not included in the overview of Territory Growth Towns on the following pages.

Territory Growth Towns – Northern Region

MILINGIMBI
- Population 1500
- Diesel power station
- Groundwater supply
- Water source is finite and under significant pressure
- Water is of very good quality
- Treated by disinfection system
- Annual water consumption 204 mega litres (515 l pppd)

YIRRKALA
- Population 990 people
- Power supply by private grid from Nhulunbuy power station
- Groundwater supply treated by disinfection system
- The water source is plentiful and of very good quality
- Annual water consumption 298 mega litres - (982 l pppd).

GAPUWIYAK
- Population 1200
- Diesel power station
- Groundwater supply treated by disinfection system
- Water source is limited
- Water source very good quality
- Annual water consumption 411 mega litres (414 lpppd).

WADEYE
- Population 2670
- Diesel power station
- Surface water supply treated by disinfection system
- Water source is plentiful and quality is good
- Annual water consumption 398 mega litres (558 l pppd).

WURRUMIYANGA (NGUIU)
- Population 1580
- Diesel power station
- Groundwater supply
- Water source limited
- Water source good qualify
- Disinfection system
- Annual water consumption 442 mega litres (798 l. pppd)

UMBAKUMBA
- Population 470
- Diesel power station
- Groundwater supply treated by disinfection system
- Water source is limited and source quality is good.
- Annual water consumption 158 mega litres (1047 l pppd)

GUNBALANYA
- Population 1480
- Diesel power station
- Combined ground and surface water supply treated by disinfection system
- Water source is limited
- Water source is of good quality
- Annual water consumption 284 mega litres (737 l pppd)

MANINGRIDA
- Population 2750
- Diesel power station Groundwater supply
- Water source is plentiful
- Water source very good quality
- Disinfection system
- Annual water consumption 424 mega litres (440 l. pppd) y.

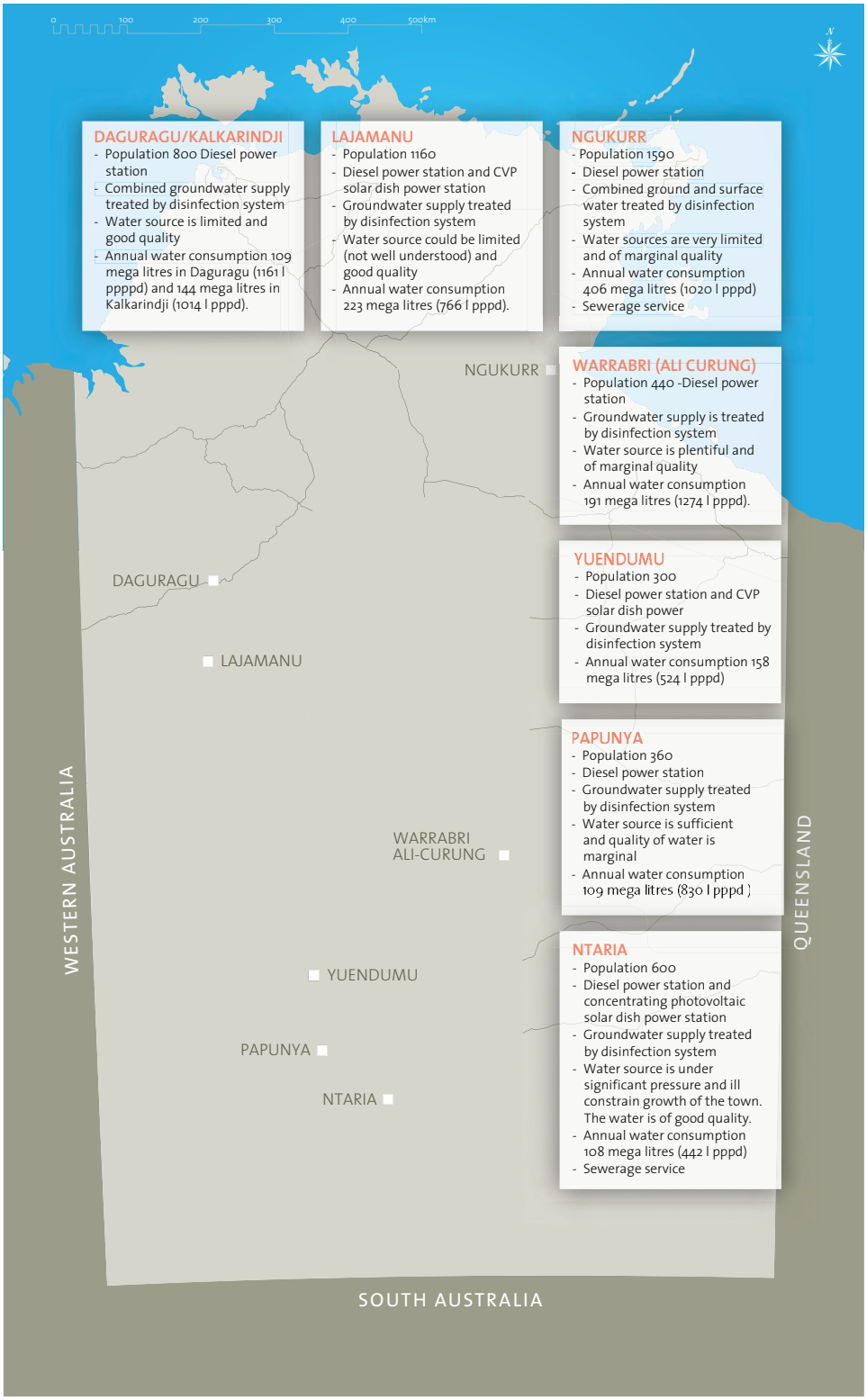
ANGURUGU
- Population 1270
- Private grid power supply
- Combined ground and surface water supply treated by disinfection system by GEMCO
- Water source is plentiful and of very good quality
- Annual water consumption 296 mega litres (823 l pppd)

RAMINGINING
- Population 830
- Diesel power station
- Groundwater supply treated by disinfection system
- Water source is adequate and of very good quality
- Annual water consumption 196 mega litres - (684 l pppd)

GALIWINKU
- Population 2150
- Diesel power station
- Groundwater supply treated by disinfection system
- Water source is finite
- Water source is of good quality.
- Annual water consumption 604 mega litres - (807 l pppd).

NUMBULWAR
- Population 1200
- Diesel power station
- Groundwater supply treated by disinfection system
- Water source is confined and marginal quality.
- Annual water consumption 208 mega litres - (709 l pppd)

Territory Growth Towns – Katherine, Barkly and Southern Region



Territory Growth Towns

The following provides an overview of the essential services and the key initiatives related to each Territory Growth Town. Please note that this report does not include information on the townships of Elliott and Borroloola, as essential services are delivered by Power and Water and not through IES.

Angurugu

Angurugu is one of five communities selected to receive upgrades to water supply and wastewater systems as part of a $20.25 million allocation from the Australian Government. Power and Water undertook a hydrogeological assessment and investigation in 2009-10 with drilling and augmentation works expected to start in 2011-12.

An Australian Government grant of $570 000 will be used to remove the water intake from the river from the day to day service and to establish new bores as the existing bore is close to the town's sewage system which poses a potential risk of contamination to the water supply. The grant will also be used to increase the capacity of water storage tanks.

Design is to be undertaken by the Strategic Indigenous Housing and Infrastructure Program to upgrade the community's 30-year-old septic tank effluent drainage and asbestos pipe work sewer reticulation system.

Daguragu/Kalkarindji

The remote community of Kalkarindji will soon join the growing ranks of remote communities powered by solar energy. A concentrating photovoltaic (CPV) solar dish system is planned for the community which is currently powered with a diesel power station, which also provides power for the nearby community of Daguragu. The CPV system will supply 660 000 kWh each year for Kalkarindji.

Galiwinku

Galiwinku is one of five communities selected to receive upgrades to water supply and wastewater systems as part of a $20.25 million allocation from the Australian Government. A $1.82 million grant will be used to equip four new production bores and augment the groundwater production system and water storage capacity to increase the amount of water available to the growing community.

Works are proposed through the Strategic Indigenous Housing and Infrastructure Program for the water storage tanks. The grant will also be used to increase the size of the sewage treatment ponds so they can cope with increased demand from planned new housing and associated development.

Gapuwiyak

Investigations have been undertaken at Gapuwiyak for a drilling program to increase water supply through augmentation of production bores to match expected housing under the Strategic Indigenous Housing Infrastructure Program.

The town's current water supply source has limited availability in the dry season to meet the community's demands. Investigations have recommended that future drilling programs target new resources and relocate the bore field away from town to protect capacity and quality of future water supplies.

Gunbalanya

Gunbalanya is one of four communities with water meters installed at all Indigenous houses as part of Power and Water's strategy to monitor water demand and help understand water use. Gunbalanya has a limited water source and higher than desired demand and the meters will help manage that demand.

Consultation with community members in Gunbalanya has identified a need for a focused community water management plan. The community's groundwater resource is enough to meet current demand but it is expected that population growth and complex geology around the community creates potential future water supply issues if demand increases.

Community water planning started in July 2008 and the project is now in stage four of the community engagement framework to design a Water Action Plan. Many members of the community, including shire staff, the local housing reference group, the Australian Government Business manager and the Indigenous Engagement officer have been very supportive of the program.

With this local support and enthusiasm, Power and Water has compiled a community water plan that identifies potential water conservation actions to be implemented in 2010-11. Options under consideration include retrofitting housing stock with new water efficient products and a targeted marketing campaign to educate, encourage and empower residents to conserve water.

Lajamanu

Investigations have been undertaken at Lajamanu for a drilling program to increase groundwater supplies. The investigations have recommended a program of drilling, new investigation and production bores to increase water demand in line to support new housing built under the Strategic Indigenous Housing and Infrastructure Program.

Maningrida

Maningrida has infrastructure upgrades proposed under the Strategic Indigenous Housing Infrastructure Program. Works proposed to be undertaken by SIHIP include a new ground level tank in the borefield that will gravity feed significant parts of the community.

A large subdivision is proposed to be constructed through SIHIP. Power and Water is undertaking investigations to augment the borefield to connect bores to the tank being constructed under SIHIP.

Milingimbi

Investigations have been undertaken into the groundwater supply issues at Milingimbi. Initial investigations have identified issues with the sustainability of current and potential future extraction of groundwater on the island. It is anticipated that investigation of alternative source options may be required.

Power and Water began an exciting collaborative initiative with the Yolngu Aboriginal Consultancy at Charles Darwin University to engage with the community on conserving water and managing demand on the water supply. The aim of the program was to make water conservation meaningful to the local community through highlighting the links between Power and Water and their traditional water story.

After creating the "shared stories" Power and Water has begun working with the community to formulate a plan to conserve water through respectful engagement with senior land owners and custodians, and sensitivity and collaborative strategies for training local people in plumbing and essential services skills and qualifications.

Power and Water and the Milingimbi community will work together to implement a community-based water conservation program in 2010-11.

Ngukurr

Ngukurr relies on both ground and surface water and over recent years has experienced a decrease in groundwater quality. Investigations indicate that this is probably due to sustainability issues with the borefield and historical extraction practices. Additional bores have been drilled and are proposed to be equipped to improve redundancy in the existing borefield and short term improvement in water quality for housing and other developments.

Drilling by the Department of Natural Resources, Environment, the Arts and Sports has identified sources approximately six kilometers from the existing supply that appears better in quality and that may improve the sustainability of water supply to the community. It is anticipated that this resource would be targeted to support growth in the community. Significant infrastructure would be necessary to connect this borefield into the water system.

The community's diesel power station is isolated in the wet season due to flooding closing the river crossing for a significant length of time.

Numbulwar

Investigations have been undertaken at Numbulwar to improve groundwater supplies. The investigations have recommended works within the existing borefield to increase water production to support new housing built under SIHIP.

In March 2010 winds and heavy rains from ex Tropical Cyclone Paul damaged the power supply to Numbulwar while localised flooding affected maintenance of the water supply. These utilities were quickly restored by Power and Water.

Ntaria

Groundwater investigations have been undertaken at the Ntaria (Hermannsburg) community, with a recommended drilling program proposed to increase water supplies to meet demand as homes are built in the community under the Strategic Indigenous Housing Infrastructure Program.

The existing water supply system in Ntaria includes four equipped bores approximately four kilometres from town which pump water to a one million litre ground storage tank on a ridge to the north-west of the town. Water is then transferred by pumps to a 60 kilolitre elevated reservoir tank before being gravity fed to the town's reticulation system.

The Ntaria sewerage system is a conventional gravity reticulation system with the sewers draining into two sewage pump stations before being pumped to two waste stabilisation ponds.

Papunya

Papunya's water supply is operating at close to capacity and it is anticipated that local capacity will be improved with the equipping of a new bore in 2010-11. The water is currently treated by a chlorinator at the water compound, between the ground level and elevated storage tanks, which was installed in early 2009.

Ramingining

Ramingining is accessible by road and air but suffers from road closures during the wet season, relying on a weekly freight barge service from Darwin to Ramingining via the Glyde River.

Power and Water replaced ground water storage tanks at Ramingining in 2010.

Upgrades to the power system were also undertaken.

Umbakumba

Umbakumba is one of five communities selected to receive upgrades to water supply and wastewater systems as part of a $20.25 million allocation from the Australian Government. Umbakumba has had $880 000 targeted for improvements to the borefield and replacement of pumps. A further $310 000 in funding will be spent to increase the water storage capacity with a new ground level tank.

Wadeye

Wadeye is one of five communities selected to receive upgrades to water supply and wastewater systems as part of a $20.25 million allocation from the Australian Government.

A total of $10.92 million will be spent to increase the capacity of the bores in Wadeye, which are currently struggling to meet demand and new bores are required to increase the quality and supply of water. The project is proposed to involve drilling and establishment of new production bores at Wadeye and one new bore at Manthathpe, two kilometers north-west of the main town area.

Power and Water is planning for the construction of a gas pipeline to Wadeye from the Bonaparte Gas Pipeline and construction of a new gas-fired power station for the remote community. The gas-fired power station will increase electricity generation capacity for the community as the existing power station is 30 years old and no longer adequate to meet future demand as housing and the population grow. The gas-fired power station will be located away from the town.

Ali Curung – Warrabri

The community of Warrabri is leading the way in educating residents on how to conserve water with a specially designed water conservation strategy. Warrabri was chosen due to the higher than average water consumption within the community. Environmental consultants, Live and Learn Environmental Education, were commissioned by Power and Water to create a water conservation design informed by local community residents.

The key recommendation made by residents was to establish a locally driven water conservation campaign using local water leaders or "water rangers". The program will provide local employment, empowerment and on the job training for local community members combined with behaviour changing techniques and tools for the whole community.

Warrabri has been given priority for the delivery of a water treatment system to improve the quality and security of the local water supply to meet Australian Drinking Water Guidelines. The water treatment system will reduce concentrations of nitrate, fluoride, salinity and hardness.

Wurrumiyanga (Nguiu)

About 120 million litres of groundwater will now be saved each year at the community of Wurrumiyanga after the installation of computer control equipment at the power station. The Supervisory Control and Data Acquisition (SCADA) computer monitoring and control equipment was installed to detect when storage tanks are full and automatically shut off bores to prevent overflows. The new control system is operated by the Essential Services Operator from a computer stationed at the Wurrumiyanga power station and can now control which bores, valves and storages are used without travelling to different locations, which can be more than 10km away.

Wurrumiyanga is one of five communities selected to receive upgrades to water supply and wastewater systems as part of a $20.25 million allocation from the Australian Government.

While Wurrumiyanga's water supply is secure the community experiences water supply problems and low water pressure at the end of the dry season due to problems with infrastructure, and multiple tanks and pumps within the system. Funding of $410 000 will be used to establish new and refurbish existing bores and improve pipework from the bore field to increase production. A further $2.3 million of funding will be used to upgrade and increase water storage tanks and required pumps.

Power and Water collaborated with CSIRO (engaged by the Department of Natural Resources, Environment and the Arts) to engage Tiwi Island people in understanding how their water system and groundwater resources function.

Water planning workshops were carried out in Pirlangimpi and Milikapiti in late 2009, and early 2010 for Wurrumiyanga. CSIRO researched planning tools and methods to improve Indigenous engagement, while Power and Water

helped with the discussions around water which contributed to an increase in the education and understanding of the local water story.

Yirrkala

Groundwater investigations have been undertaken at the Yirrkala community, with a recommended drilling program proposed to increase water supplies to meet demand as homes are built in the community under SIHIP.

The town is supplied with water from two production bores, which deliver water to two ground level tanks with a combined water storage capacity of 630 kilolitres.

The power station is operated by Rio Tinto in Nhulunbuy and services Yirrkala and surrounding communities as well as the mine site. Yirrkala is serviced by a water borne sewer system which is made up of a conventional gravity mains serving all housing and town buildings.

Yuendumu

Quick actions by Remote Operations staff kept the power station at Yuendumu in operation after flooding saw a fuel delivery cancelled in the wake of tropical Cyclone Laurence in 2009. The community and its 1000 residents were cut off from Alice Springs by flooding after heavy rains in Central Australia.

The community's four to five week minimum stock of fuel was under threat when the usual fuel delivery could not make it through to the community due to heavy rains damaging the roads. Staff identified and collected 20 of the 150 litre drums of fuel at the now decommissioned power station at Yuelamu, 40km away, in a great logistical feat using smaller trucks to navigate the water damaged roads.

Power and Water worked with the shire, police, schools and health centres to conserve energy, reducing demand by a significant eight per cent to save on fuel. Excellent communication between staff, community and other agencies avoided unnecessary panic and damage to the roads while keeping the power on.

The power station at Yuendumu uses concentrating technology with 10 solar dishes that generate 240 kilowatts of power, which will save about 63 000 litres of fuel each year.

BELOW ▸ FUEL DELIVERY TO EPENARRA

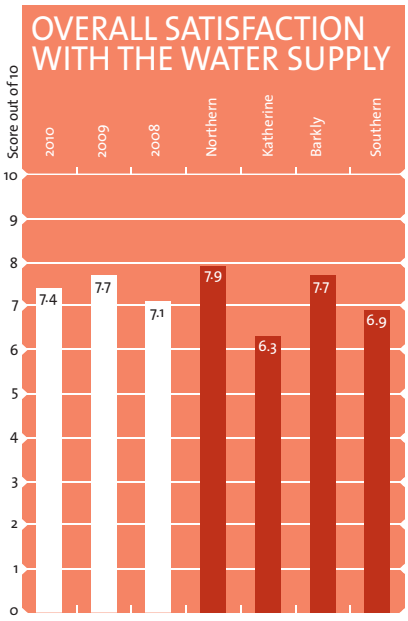
Feedback

Customer Satisfaction Survey

Power and Water undertakes annual customer satisfaction research among its stakeholders across the 20 Growth Towns and 52 remote communities it services. Interviews were held with 166 of the listed customers between 21 September and 2 October 2009 and included the major stakeholders of school principals, shire service managers, health centre managers, Australian Government Business Managers and community store managers.

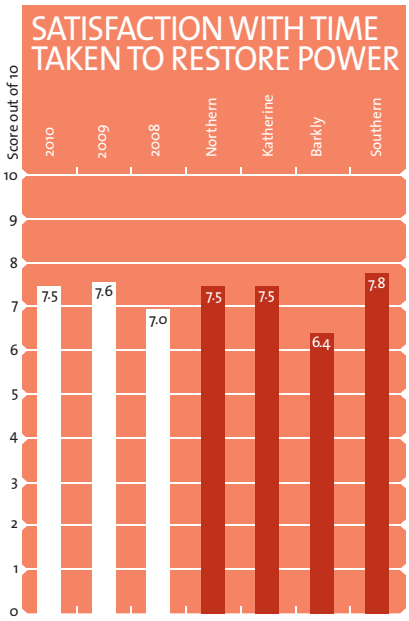
The Customer Satisfaction Survey results indicate that Power and Water is trusted and appreciated. Scores across all satisfaction and performance ratings were close to 8 out of 10, indicating that Power and Water Remote Operations is satisfying the needs of most of its customers and stakeholders.

In addition to the overall satisfaction, stakeholders provided valuable feedback in relation to the water and electricity supply.

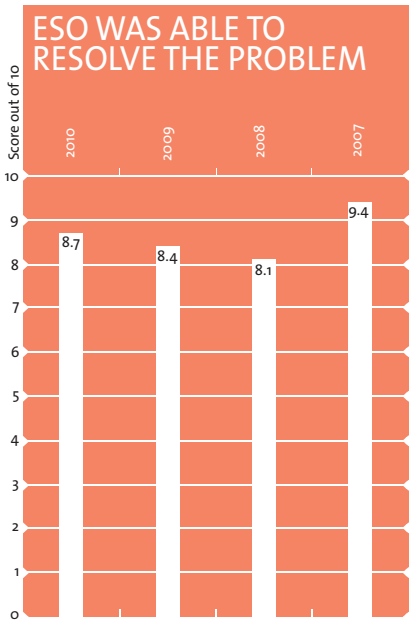


Comparison of the overall satisfaction of the water supply over time and region.

The survey revealed customers were as happy or happier with the supply and quality of water in their community with the colour and regularity of water supply given higher scores in 2009 compared to the 2008 survey.



Satisfaction with the time taken to restore power, averaged between planned and unplanned outages, over time and region.



87% of problems brought to the ESO by the respondent were able to be resolved by the ESO.

The number of residents that had contact with the ESO was unchanged from 2009 at 62%. Power outages were the most common reason for the contact. In line with the normalisation, the proportion of customers contacting their ESO for a power interruption or problem has significantly reduced as they now contact the PWC call centre. Results suggest that the majority of problems brought to an ESO were resolved.

Power and Water also received high satisfaction scores with the time taken to restore power and water supplies for both planned and unplanned power outages.

Our People

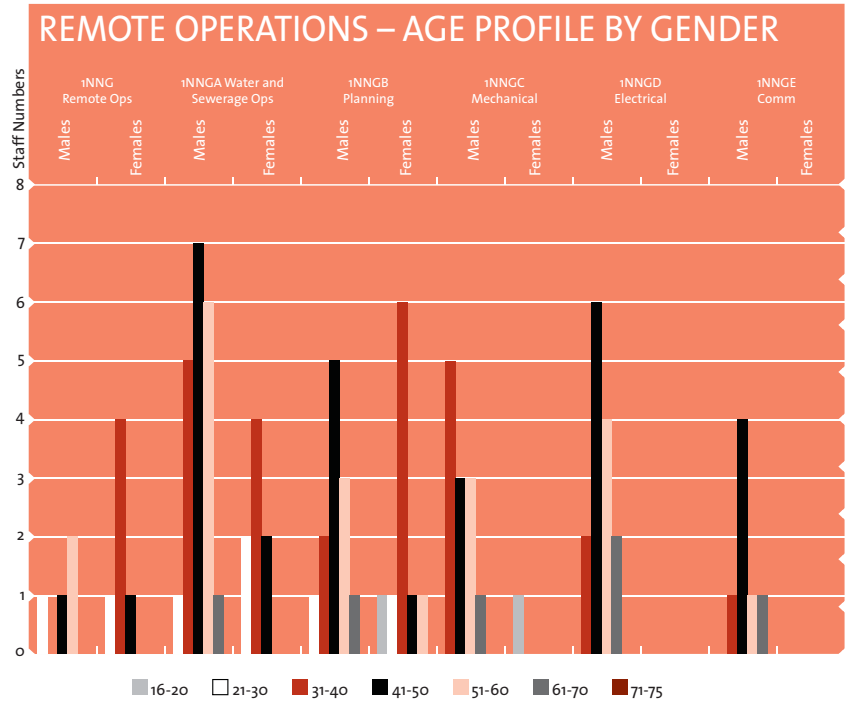
Power and Water strives to create an energised and balanced team of employees working together and operating at their full potential. Supporting Indigenous employment and training for everyone is a priority.

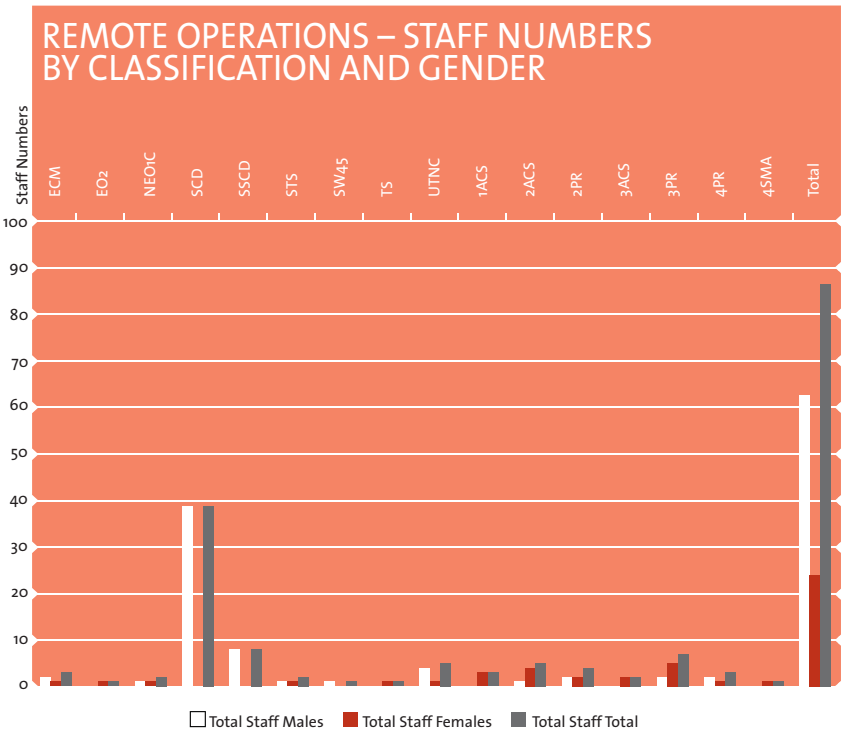
The Remote Operations workforce has changed over the past few years from being male dominated and mainly trades and technical personnel. Over time Power and Water has seen an increase in the number of female employees and the professional skills base represented in its Remote Operations' staff.

A review of the Remote Operations' workforce capability in 2007 resulted in the employment of more professional staff with skills and qualifications in water science, environmental science, and environmental, civil, mechanical, electrical and renewable energy engineering.

The addition of professional and technical skills has increased strategic planning, asset management and project management to meet new business objectives and increased planning, development and large construction works. In 2007-08 only 10 per cent of employees were female. The number of female employees has doubled with females comprising 24 per cent of the workforce in 2009-10.

The breakdown of staff according to their job classification and gender can be seen in the graph (lower right).





Essential Services Operators

Power and Water provides utility services through contract arrangements where local Essential Services Operators (ESOs) operates and maintain the systems. There are 131 ESOs, of whom 37 per cent are Indigenous.

The ESOs conduct daily, weekly and monthly duties for all essential service disciplines including water quality testing, diesel generator servicing and meter reading for retail services in remote communities.

The ESOs are employed through shire councils, private contractors, pastoral companies, Indigenous incorporated bodies and community government councils. There are seven Essential Service Agreements with shire councils, with the East Arnhem Shire Council not involved, and 21 agreements with other entities.

Three year Essential Services Agreements were established with the eight shire councils in July 2008 with an option for an extension of two years so they expire in 2013. Private contractors took over duties from the East Arnhem Shire Council on 1 October 2009.

The ESO requires a broad range of skills, knowledge and experience in power, water and sewerage infrastructure, operations and customer services to safely, effectively and efficiently carry out the duties.

Power and Water acknowledges the crucial role played by the ESOs with their valuable local knowledge and existing relationships within the community. The ESOs are the eyes and ears on the ground for Power and Water and are a valuable workforce who can respond to different situations and needs quickly and effectively.

Power and Water provides comprehensive inductions, residential training courses, on site training and mentoring. In addition, quarterly reviews of contracts focus on ESO performance, workforce planning and developing capacity. Power and Water works to ensure ESOs work in a safe environment with a commitment to occupational, health and safety training.

Three-day familiarisation training workshops are held every year in the major regional centres of Darwin, Katherine and Alice Springs for Essential Services Operators (ESOs).

The essential services familiarisation and training workshop equips ESOs with the skills to work in the field and covers occupational health and safety, electrical and water services as well as practical exercises such as fire suppression and managing dangerous substances.

Power and Water supports the trainees of Certificate II in Electrotechnology in partnership with local shires, Group Training NT and Charles Darwin University. The qualification is suitable for the ESO traineeship program which aims to increase capacity within remote communities and Indigenous employment. Power and Water is committed to upskilling local people within remote communities and providing a clear and achievable pathway to meaningful employment. Power and Water supports eight to 10 traineeships in each of the Darwin, Katherine and southern regions.

Indigenous Employment

Power and Water has been working to maximise Indigenous employment. The table below provides an overview of the number of Essential Services Operators identified as Aboriginal and Torres Strait Islander (ATSI) and non-ATSI in June 2010.

	Nominated ESO		Nominated Relief ESO		Total		
	non-ATSI	ATSI	non-ATSI	ATSI	Total ESOs	Total ATSI	% ATSI
Darwin	17	6	12	4	39	10	25.6
Katherine	7	11	6	5	29	16	55.2
Alice Springs	16	13	25	9	63	22	34.9
Total	40	30	43	18	131	48	37%

Our Partnerships

Service Agreements Department of Local Government, Housing and Regional Services

Indigenous Essential Services Pty Ltd has a five-year (2005-06 to 2009-10) agreement with the Northern Territory Government administered by the Department of Local Government, Housing and Regional Services (DHLGRS) as its agent, to help fund the delivery of essential services in the communities. The agreement has an option for an extension.

The objectives of the agreement with the Northern Territory Government are to provide:

- reliable and equitable services to Territory funded Indigenous towns and communities.
- effective management of the assets including optimal repair and maintenance programs.
- efficient financial management, providing low cost services, works, repair and maintenance programming.
- support of regional development and Indigenous employment and training.

IES and the DHLGRS will work in close partnership to deliver services. The purchase of additional services by DLGHRS is on a fee-for-service basis. Ownership of water supply, sanitation and electricity assets is vested in Indigenous Essential Services Pty Ltd.

The agreement with the Northern Territory Government establishes the types of services to be provided and specifies service level guidelines.

Service Agreements Power and Water Corporation

Power and Water provides management, professional, technical, retail and corporate services to deliver commitments to customers and the Northern Territory Government as defined in an agreement with Indigenous Essential Services Pty Ltd.

Other Service Relationships

Power and Water, and by association IES, also has partnerships with the following departments and agencies:

- The **Department of Health** is the regulator of drinking water quality in the Northern Territory. Power and Water is finalising a Memorandum of Understanding with the Department for managing drinking water quality in Power and Water's area of control.

  Power and Water works very closely with the Chief Health Officer to establish and continuously review monitoring programs to verify water quality, incident response protocols and proposed actions to improve the infrastructure for extraction, treatment, storage and distribution of potable water. This *Indigenous Essential Services Annual Report 2009-10* is provided to the Chief Health Officer in compliance with regulatory obligations.

- The **Department of Housing, Local Government and Regional Services** (DHLGRS) is responsible for the management and maintenance of houses in remote communities that Power and Water supply electricity, water and sewerage services.

  Based on relationships already in place, working with DHLGRS may provide opportunities to reduce wastage when both housing conditions and householder water use behaviours can be major contributing factors to water usage.

- The **Department of Natural Resources, Environment, the Arts and Sport** (NRETAS) regulates water extraction from ground and surface water resources for community, farming and industrial use across the Northern Territory. The department focuses on Water Control Districts, which are areas proclaimed to need a higher level of water management due to pressure on water resources from development. To ensure suitable management of water in Water Control Districts, Water Allocation Plans (WAP) provide an assessment of the sustainability of water sources and establish a balance between extracting and conserving water for environmental purposes.

  Water users (such as Power and Water) are licensed to extract an allocation of water and are required to monitor and report water information. WAPs are being established in almost 20 Indigenous communities and Power and Water has almost 20 licences that regulate water extraction in those locations. Where appropriate, there is also an opportunity for Power and Water to collaborate with NRETAS to ensure the sustainability of water resources in other ways.

- Power and Water is collaborating with **Commonwealth Scientific and Industrial Research Organisation** (CSIRO) to develop a water plan that engages Tiwi Island people in understanding how their water system and groundwater resources function.

  Water planning workshops were carried out in Pirlangimpi and Milikapiti in late 2009, and early 2010 for Wurrumiyanga (Nguiu). CSIRO researched planning tools and methods to improve Indigenous engagement, while Power and Water helped with the discussions around water which contributed to an increase in the education and understanding of the local water story.

- Power and Water successfully obtained $648 000 from the **Australian Government Bureau of Meteorology** towards funding a $1 097 125 program of groundwater monitoring stations.

  The permanent installations of Supervisory Control and Data Acquisition technology enabled digital groundwater level loggers to be installed in 34 remote Indigenous communities between 2008 and 2011. This project is a part of the Bureau's $80 million Modernisation and Extension of Hydrologic Monitoring Systems Fund, to help water managers to modernise and extend their water monitoring systems.

BELOW ▸ HERMANSBURG POWER STATION YARD

Our Governance

Corporate Governance Statement

Indigenous Essential Services Pty Ltd is a wholly owned, not-for-profit subsidiary of Power and Water Corporation. Its Board of Directors, who are also on the Power and Water Board, are:

Ms Judith King (Chairman)

BA, Foundation fellow AICD

Ms King was appointed Chairman of IES Pty Ltd on 1 July 2007, and has been a director since its establishment in June 2003. With extensive Board experience in the private and public sector, she was formerly a Director of Melbourne Water Corporation and Citipower and closely involved in the restructure and reform of the Victorian utility sector. Ms King's current appointments include Swinburne Ventures Ltd; National Aging Research institute; the Victorian Commission for Gambling Regulation; and the NT Environment Protection Authority. Ms King was awarded an Australian Centenary Medal in 2003.

Mr Barry Chambers

FIE Aust., FAICD

Appointed to the Power and Water Corporation board in March 2007, Barry Chambers has been a professional engineer with local, Territory and Federal governments in the areas of engineering services, infrastructure, public buildings, town planning, land management and environmental services. For 13 years he held Chief Executive Officer positions in NT government agencies – including the former Power and Water Authority – and as a director and chairman of various Corporations Act entities. He has extensive experience in strategic planning, project management, budget management, workplace relations, government decision making processes and ministerial liaison. He is currently Chairman of NT Build and the NT Building Practitioners board.

Mr Peter Vines (until October 2009)

B.Com, MBA, FIE Aust., MAICD

Mr Vines has been a member of Power and Water's board since 2005. He has extensive experience in the energy and infrastructure industry both in Australia and internationally. He was previously Managing Director of a major US utility in Australia, Vice President of International M&A and Executive General Manager of Origin Energy. He has been a director of various companies as part of his executive responsibilities and he is also currently a board member of Melbourne Water Corporation, JackGreen Limited and Carroll and Richardson Pty Ltd.

Mr Michael Hannon AM

Mr Hannon was appointed to the Power and Water Board in August 2009. Mr Hannon is Chairman of the Hannon Group of Companies, a family-owned group operating public transport, property investment, crocodile farming and exporting businesses. Mr Hannon was born and permanently resides in Darwin and developed his career in the Northern Territory. The Hannon Group also has business interests in Queensland, Victoria and New South Wales. The group employ more than 300 Territorians and that number again interstate.

Mr Andrew Macrides

Dip Bus (Mgt), B Bus (Acc), MBA, FCPA, FAICD

Mr Macrides was appointed as Director of IES Pty Ltd on 1 July 2007 after his appointment as Managing Director of Power and Water Corporation. Born and raised in Darwin, Mr Macrides has extensive government and management experience, beginning his career in the accounting field in 1978. Prior to joining the then Power and Water Authority in 1998, he worked across a range of sectors in the Northern Territory Government, including health, housing, community services and tourism.

Indigenous Essential Services Pty Ltd Statistics

Statistical Summary as at 30 June 2010

	Units	2005	2006	2007	2008	2009	2010
ELECTRICITY							
Generation							
Installed capacity (including solar)	MW	45	48	51	56	60	69
Installed capacity – solar	MW	-	0.5	0.7	0.7	0.8	0.8
Electricity generated (including solar)	GWh	85	94	95	97	106	112
Electricity generated – solar	MWh	-	1.0	1.6	1.0	0.8	0.7
Electricity sent out (including solar)#	GWh	79	86	86	89	109	120
Purchases from private suppliers	GWh	7	7	8	8	8	8
Distribution (22/11kV and below)							
HV Overhead	km	341	344	373	349	473	513
HV Underground	km	1	1	1	5	5	5
LV Overhead	km	248	253	278	278	278	278
LV Underground	km	1	1	1	4	3	3
SWER All Voltages	km	87	87	87	87	87	87
Sales##	MWh	58,893	60,019	60,574	63,665	104,501	112,030
Customers (ie. service)	No. of	6,818	7,213	7,373	7,421	7,540	8,116
WATER							
Total sourced water	ML/day	10,104	9,733	9,250	9,846	9,848	9,792
Length of mains	km	647	649	649	649	652	654
Customers (ie. services)	No. of	530	524	527	1,108	1,948	2,497
WASTEWATER							
Volume of sewage treated	ML	2,732	3,508	3,552	3,835	3,940	3,917
Length of sewer mains	km	302	302	303	303	305	307
Volume of effluent reused	ML	-	-	-	-	-	-
Customers (ie. services)	No. of	407	420	420	426	432	465

 # From 2008-2009, Electricity Sent Out includes electricity sent out to IES communities purchased from Power and Water power grids. This has not been included in previous years.

From 2008-2009, Electricity Sales includes all prepayment and credit meter sales. Previous years' data does not include all prepayment meter sales.

Funding Arrangements

In 2009-10 revenue collected from the sale of electricity, water supply and sewerage services was $23.2 million (2009: $19.2 million). Total revenue for 2009-10 was $98.3 million. This included $45.0 million of recurrent grant funding (2009: $50.5 million) and $23.8 million of capital grant funding (2009: $20.6 million) which was received from the Northern Territory Government. The capital grant is used to replace existing assets and maintain service standards.

Major cost drivers over the 2009-10 financial year resulted from:

- an increase in electricity, water and sewerage uniform Power and Water tariffs of 4 per cent (Consumer Price Index), tariff increases for electricity of 18 per cent (for electricity customers who consumer more than 750 megawatt hours [MWh] per annum) and 20 per cent for water and sewerage.
- an increased focus in revenue protection resulting in electricity, water and sewerage revenue being recovered from customers that were not previously billed.
- capital contributions in the form of recoverable works of $4.6 million
- gifted assets of $400 000.

The Indigenous Essential Services asset portfolio consists of:

- power station buildings that accommodate mostly diesel engines, including fuel receiving, transfer and storage facilities.
- electrical distribution systems, up to and including customers' meters.
- water infrastructure including surface water harvesting, groundwater production bores, bore-pumps, tanks, transfer pumping stations, water treatment and water supply reticulation systems, up to the customers' property boundaries.
- sewerage infrastructure, starting at the customers' boundaries, including collection mains, pumping stations and wastewater treatment, reuse and disposal systems.

BELOW ▸ DRILLING AT BESWICK

Appendix A

Water sources

Northern Region

Source of water supplied to northern region communities and community water consumption

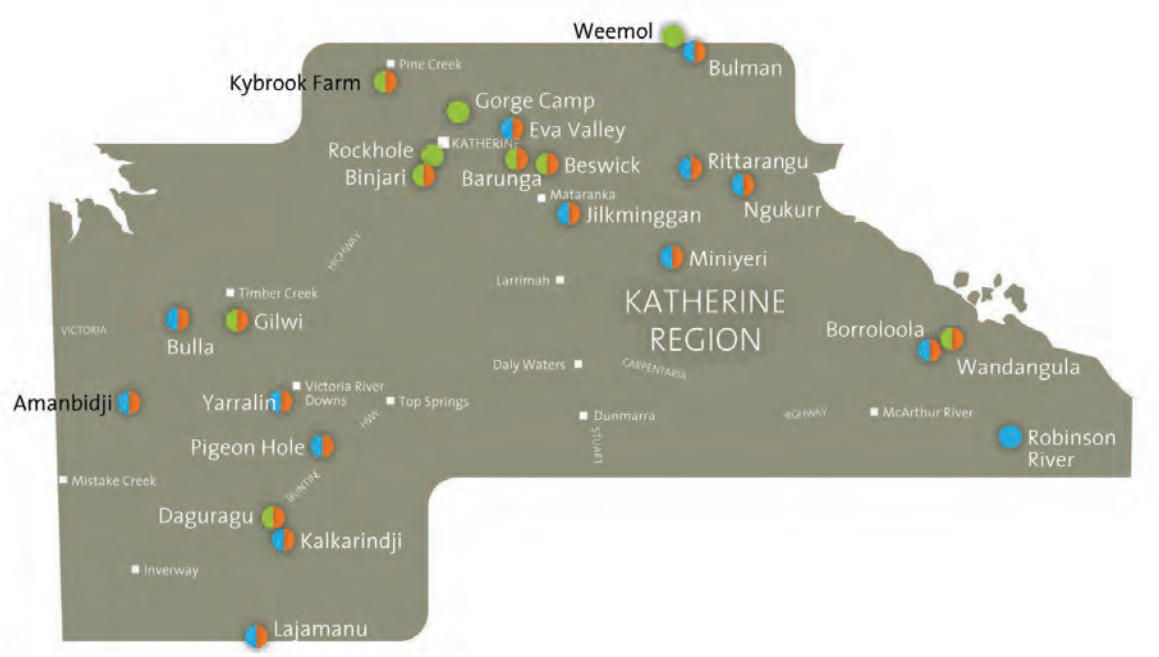
Summary of Water Supply Systems in the Northern Region

Community	Alternative name[1]	Supply comment	Source of supply	Source licenced	Treatment	Disinfection type
Acacia Larrakia	Acacia Gap		Groundwater			Sodium hypochlorite
Angurugu		Treatment provided by GEMCO	Groundwater & Surface water	Angurugu River	Soda Ash	Sodium hypochlorite
Belyuen	Delisaville		Groundwater			Sodium hypochlorite
Galiwinku	Elcho Island		Groundwater			Sodium hypochlorite
Gapuwiyak	Lake Evella		Groundwater			Sodium hypochlorite
Gunbalanya	Oenpelli		Ground & Surface water			Sodium hypochlorite & UV
Gunyangara	Ski Beach		Groundwater			Sodium hypochlorite
Maningrida			Groundwater			Calcium hypochlorite & UV
Milikapiti	Snake Bay		Groundwater			Sodium hypochlorite
Milingimbi			Groundwater			Sodium hypochlorite
Milyakburra	Bickerton Island		Groundwater			Sodium hypochlorite
Minjilang	Croker Island		Groundwater			Sodium hypochlorite
Nauiyu	Daly River		Groundwater			Sodium hypochlorite
Wurrumiyanga	Nguiu, Bathurst Island		Groundwater			Sodium hypochlorite
4 Mile Camp (outstation)		Wurrumiyanga water grid	Groundwater			Sodium hypochlorite
Numbulwar			Groundwater			Sodium hypochlorite
Nganmarriyanga	Palumpa		Groundwater			Sodium hypochlorite
Peppimenarti			Groundwater			Sodium hypochlorite
Pirlangimpi	Garden Point		Groundwater		Sand Filter	Sodium hypochlorite & UV
Ramingining			Groundwater			Sodium hypochlorite
Wulkabimirri (outstation)		Ramingining water grid	Groundwater			Sodium hypochlorite
Umbakumba			Groundwater			Sodium hypochlorite
Wadeye	Port Keats		Surface water			Sodium hypochlorite
Warruwi			Groundwater			Sodium hypochlorite
Yirrkala			Groundwater			Sodium hypochlorite

1 The alternative names provided are commonly known; other titles for the majority of these communities also exist.

Katherine Region

Source of water supplied to Katherine region communities and community water consumption.



- Power Stations
- Transmitted Power Supply (These centres recieve their Electricity by line from adjacent centres.)
- Sewerage Services

Water — All the above communities have reticulated supply

Summary of Water Supply Systems in the Katherine Region

Community	Alternative name[1]	Supply comment	Source of supply	Source licenced	Treatment	Disinfection type
Amanbidji	Kildurk		Groundwater			Sodium hypochlorite
Barunga	Bamyili		Surface water	Bamyili Spring	Cartridge Filtration	Sodium hypochlorite & UV
Beswick	Wugularr		Groundwater			Sodium hypochlorite
Binjari			Groundwater			Calcium hypochlorite
Gudabijin	Bulla		Ground & Surface water	East Baines River	Sand Filtration	Sodium hypochlorite
Gulin Gulin	Bulman		Groundwater			Sodium hypochlorite
Dagaragu			Groundwater			Chlorine gas
Jilkminggan	Duck Creek		Groundwater			Sodium hypochlorite
Jodetluk (outstation)	Gorge Camp	Katherine water grid	Groundwater			Sodium hypochlorite
Kalkarindji	Wave Hill		Groundwater			Chlorine gas
Kybrook Farm			Groundwater			Sodium hypochlorite
Lajamanu			Groundwater			Sodium hypochlorite
Manyallaluk	Eva Valley		Groundwater			Calcium hypochlorite
Minyerri			Groundwater			Sodium hypochlorite
Ngukurr			Ground & Surface water	Roper River	Sand Filtration	Chlorine gas
Pigeon Hole			Groundwater			Sodium hypochlorite
Rittarangu	Urapunga		Groundwater			Sodium hypochlorite
Mungoobada	Robinson River		Ground & Surface water	Robinson River		Sodium hypochlorite
Weemol			Groundwater			Sodium hypochlorite
Yarralin			Groundwater			Sodium hypochlorite

1 The alternative names provided are commonly known; other titles for the majority of these communities also exist.

Source of water supplied to Barkly region communities and community water consumption

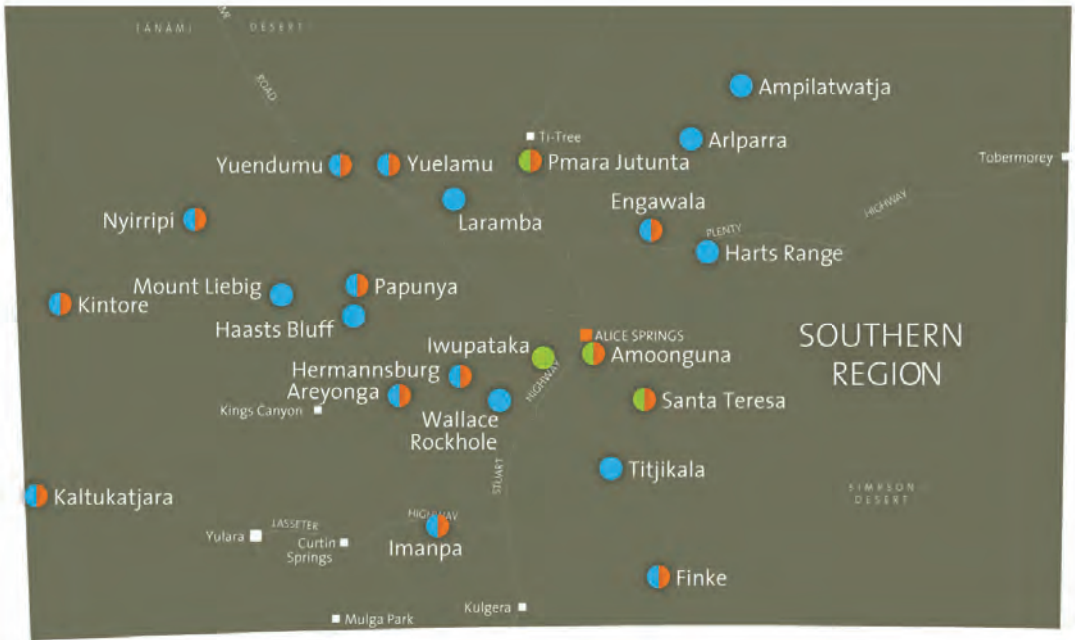
Summary of Water Supply Systems in the Barkly Region

Community	Alternative name[1]	Supply comment	Source of supply	Source licenced	Treatment	Disinfection type
Warrabri	Ali Curung		Groundwater	Groundwater		Sodium hypochlorite
Alpurrurulam	Lake Nash		Groundwater			Calcium hypochlorite
Canteen Creek	Orwaitilla		Groundwater			Sodium hypochlorite
Imangara	Murray Downs		Groundwater	Groundwater		Calcium hypochlorite
Nturiya	Ti Tree Station		Groundwater	Groundwater		UV
Tara			Groundwater	Groundwater		Calcium hypochlorite
Willowra			Groundwater			Sodium hypochlorite
Wilora			Groundwater	Groundwater		UV
Wutunugurra	Epenarra		Groundwater			Sodium hypochlorite

1 The alternative names provided are commonly known; other titles for the majority of these communities also exist.

Southern Region

Source of water supplied to southern region communities and community water consumption



- Power Stations
- Transmitted Power Supply (These centres recieve their Electricity by line from adjacent centres.)
- Sewerage Services

Water — All the above communities have reticulated supply

Summary of Water Supply Systems in the Southern Region

Community	Alternative name[1]	Supply comment	Source of supply	Source licenced	Treatment	Disinfection type
Amoonguna		Alice Springs water grid	Groundwater			Chlorine gas
Ampilatwatja	Ammaroo		Groundwater			UV
Areyonga	Utju		Groundwater			Sodium hypochlorite
Atitjere	Hart Range		Groundwater			Calcium hypochlorite
Engawala	Alcoota		Groundwater			Calcium hypochlorite
Finke	Apatula		Groundwater			Calcium hypochlorite
Haasts Bluff	Ikuntji		Groundwater			Sodium hypochlorite
Ntaria	Hermannsburg		Groundwater			Calcium hypochlorite
Imanpa			Groundwater		Aeration	Calcium hypochlorite
Kaltukatjara	Docker River		Groundwater		Aeration	Calcium hypochlorite
Kaporilya (outstation)		Ntaria water grid	Groundwater			Calcium hypochlorite
Kintore			Groundwater			UV
Laramba	Napperby		Groundwater			Calcium hypochlorite
Lyilyalanama (outstation)		Ntaria water grid	Groundwater			Calcium hypochlorite
Mt Liebig			Groundwater			Sodium hypochlorite
Nyirripi			Groundwater			Sodium hypochlorite
Papunya			Groundwater			Sodium hypochlorite
Pmara Jutunta		Ti Tree water grid	Groundwater	Groundwater		Sodium hypochlorite
Santa Teresa			Groundwater			Sodium hypochlorite
Titjikala	Maryvale Station		Groundwater			Sodium hypochlorite
Tjuwanpa Resource Centre		Ntaria water grid	Groundwater			Calcium hypochlorite
Ulpunda (outstation)		Ntaria water grid	Groundwater			Calcium hypochlorite
Wallace Rockhole			Groundwater			Sodium hypochlorite
Yuelamu	Mt Allan		Surface water	Yuelamu Dam	Sand Filtration	UV
Yuendumu			Groundwater			Sodium hypochlorite

1 The alternative names provided are commonly known; other titles for the majority of these communities also exist.

Appendix B

Water treatment methods used in remote Indigenous communities

Filtration	Water is passed through a filter consisting of several types of graded filter media to remove particles. Filtration is also effective in removing harmful pathogens. At regular intervals each filter is backwashed to remove trapped particles from the filter media and to maintain filter integrity and water quality. Contaminants are physically prevented from moving through the filter either by screening them out with very small pores and/or in the case of sand filters by trapping them within the filter matrix.
Aeration	Aeration is used to remove naturally occurring dissolved metals, and other contaminants from drinking water. Metals such as iron and manganese can cause red or black staining of plumbing fixtures and washing, and affect the taste of water. Over time a build-up of metal scale may block pipes. To remove dissolved metals, water is cascaded through a tower structure which promotes aeration of the water. Dissolved metals are oxidised into insoluble metal oxide forms which settle out and are removed.
Disinfection	The most common type of chemical disinfectant is chlorine. Chlorine is simple to use, destroys pathogenic microorganisms very effectively, and provides protection throughout the pipe system that distributes water to customers. Chlorine is generally added to the water storage tank before water is distributed (refer to figure on page 23). Another disinfection method is ultraviolet light (UV). Exposure to adequate doses of UV light renders bacteria, viruses and protozoa non-pathogenic to humans at that point.

Indigenous community water extraction licences held by Power and Water Corporation

Community	Source: Ground	Source: Surface	Source	Licence Number	Licence Issue Date	Licence Expiry Date	Max Water Entitlement (ML/year)	Total Community use (ML/year)	Water Control District
TOP END REGION									
Angurugu	a		Bore >15L/s	Pending				353	
		a	Angurugu River	202	22/12/2000	22/12/2010	20		
Gunbalanya (Oenpelli)		a	Fish Creek	Pending				60	
Pirlangimpi (Garden Point)		a	Blue Water Creek	Pending				228	
Yirrkala	a		Bore > 15 L/s	Pending				250	
KATHERINE REGION									
Barunga		a	Bamyili Spring	903009	23/06/2007	18/06/2012	201	124	Daly-Roper
Beswick	a		Groundwater	Pending				188	Daly-Roper
Binjari	a		Groundwater	TLA01	18/12/2009	30/04/2019	50	45	Daly-Roper
Bulla (Gudabijin)		a	East Baines River	454	02/05/2002	02/05/2012	10	39	
Bulman	a		Groundwater	Pending				62	Daly-Roper
Daly River (Nauiyu Nambiyi)	a		Groundwater	Pending				203	Daly-Roper
Eva Valley	a		Groundwater	Pending				101	Daly-Roper
Jilkminggan	a		Groundwater	Pending				56	Daly-Roper
Minyerri	a		Groundwater	Pending				74	Daly-Roper
Ngukurr (Roper River)		a	Roper River	452	02/05/2002	02/05/2012	60		Daly-Roper
	a		Groundwater	Pending					Daly-Roper
Rittarangu (Urapunga)	a		Groundwater	Pending				58	Daly-Roper
Robinson River		a	Robinson River	908001	02/03/2007	20/10/2014	20		
Wadeye (Port Keats)	a		Bore > 15L/s	Pending				454	
Weemol	a		Groundwater	Pending				19	Daly-Roper

SOUTHERN REGION									
Alpatula (Finke)	a		Groundwater	Pending			96	65	Great Artesian Basin
Ali Curung	a		Groundwater	WDP5005	29/01/2007	29/01/2017	300	264	Western Davenport
Imangara (Murray Downs)	a		Groundwater	WDP5007	31/07/2008	31/07/2018	30	14	Western Davenport
	a		Groundwater	WDP5007	31/07/2008	31/07/2018	30		
Nturiya (Ti Tree Station)	a		Groundwater	3164	12/11/2001	30/11/2011	50	15	Ti Tree
Pmara Jutunta	a		Groundwater	3164	12/11/2001	30/11/2011	50		Ti Tree
	a		Groundwater	TTWZ3172	31/12/2005	31/12/2055	50		
Tara (Neutral Junction)	a		Groundwater	TTWZ3172	31/12/2005	31/12/2055	150	21	Western Davenport
	a		Groundwater	WDP5008	31/07/2008	31/07/2018	35		
Wilora (Stirling)	a		Groundwater	WDP5008	31/07/2008	31/07/2018	35	17	Ti Tree
	a		Groundwater	TTNZ001	29/09/2009	01/10/2059	40		
Yuelamu	a		Groundwater	TTNZ001	29/09/2009	01/10/2059	40	25	
		a	Yuelamu Dam	A028001	14/04/2008	17/04/2018	100		

Appendix D

Health characteristics to help understand water quality test results

The following summary is intended to assist the reader to interpret results presented in this report. Additional information can be obtained by referring to the ADWG Fact Sheets available at: http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm

Health Characteristics

Health characteristics are water quality characteristics which may present a risk to the health of the consumer, if the consumer were exposed to concentrations above ADWG levels over a lifetime.

Arsenic

The Australian Drinking Water Guidelines (ADWG) recommend the concentration of arsenic in drinking water should not exceed 0.007mg/L. Arsenic can be introduced into ground and surface water naturally through the dissolution of minerals and ores, or from industrial effluent, atmospheric deposition (through the burning of fossil fuels and waste incineration), drainage from old gold mines, or the use of some types of sheep dip. Natural sources can make a significant contribution to the arsenic concentration in drinking water.

In Australia, arsenic concentrations typically range from less than 0.005mg/L to 0.015mg/L. Studies into the consumption of drinking water above 0.3mg/L over five to 25 years have shown effects on the skin, vascular system, nervous system, with the possibility of being carcinogenic.

Barium

The primary source of barium in drinking water is from natural sources. The ADWG recommend barium to be less than 0.7mg/L in drinking water. A number of epidemiological studies have been carried out on the effects of barium in drinking water on cardiovascular disease. No adverse effects were found with barium concentrations up to 7mg/L. In a study using a small number of volunteers, no adverse effects were observed after eight weeks exposure to drinking water with up to 10mg/L barium.

Escherichia coli (E. coli)

E. coli is a bacterial coliform excreted from the intestines of warm-blooded animals, including humans, and is an indicator of recent faecal contamination. If *E. coli* is detected in a drinking water supply, immediate action is taken in accordance with established protocols to safeguard public health.

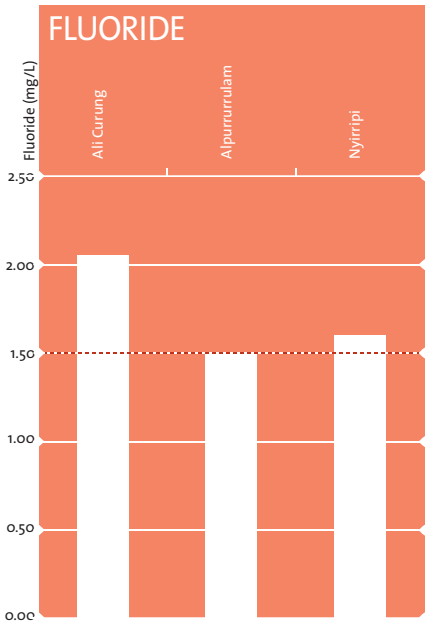
Fluoride

Fluoride is one of the most abundant elements in the Earth's crust. It naturally occurs in groundwater supplies, and is present in most food and beverage products and toothpaste. Additional fluoride is not added to any community water supplies.

The concentration of natural fluoride in Northern Territory groundwater supplies depends on the type of soil and rock that the water comes into contact with. Generally, surface water sources have low natural fluoride concentrations (around <0.1 to 0.5mg/L) and groundwater sources may have relatively high levels (range from 1-10 mg/L), particularly when the rock surrounding the water in the aquifer is rich in fluoride. The minimum fluoride for protection against dental caries is about 0.5mg/L, although around 1mg/L is required in temperate climates for optimal caries prevention. At concentrations of 1.5 to 2mg/L, teeth may become mottled due to dental fluorosis.

Most water supplies in the Northern and Katherine regions have naturally low fluoride levels due to the nature of the shallow groundwater supplies and use of surface water supplies in some communities. Most communities in the Barkly and southern regions have fluoride levels between 0.5mg/L and 1.5mg/L, of which three experience fluoride above the ADWG value of 1.5mg/L (refer to figure below).

Communities identified with average fluoride levels greater then 1.5mg/L in drinking water



Nitrate

In the Northern Territory, elevated nitrate concentrations have been partially attributed to nitrogen fixing by native vegetation and cynobacteria crusts on soils. Termite mounds also appear to be a significant nitrate source, possibly due to the presence of nitrogen

fixing bacteria in many termite species and the nitrogen rich secretions used to build the walls of mounds. The ADWG recommend that nitrate levels between 50-100mg/L are a health consideration for infants less than three months, although levels up to 100mg/L can be safely consumed by adults.

Total Coliforms and Heterotrophs

Total coliforms are a diverse group of bacteria including E.coli and other thermotolerant coliforms. Heterotrophs are organisms, including bacteria, yeasts and moulds that require an external source of organic carbon for growth. These groups of organisms provide information on the cleanliness of a water supply system. If there are high detections over long periods throughout the system, remedial actions may be taken to improve the protection of the water supply from contamination.

Uranium

Uranium is widely distributed in geological formations and can be found in groundwater aquifers surrounded by granite rocks and pegmatities and in some sedimentary rocks like sandstones. Uranium occurs as three naturally occurring isotopes and under the appropriate conditions can become soluble and therefore present in a region's groundwater. The transport of uranium in groundwater varies widely according to the aquifer conditions. Uranium may also be present in the environment as a result of mine tailings, and the use of phosphate pesticides.

Aesthetic Characteristics

Aesthetic characteristics are water quality characteristic associated with the acceptability of water to the consumer in terms of appearance, taste and odour.

Hardness (as Calcium Carbonate)

Hardness is primarily the amount of calcium and magnesium ions in water and is expressed as a calcium carbonate ($CaCO_3$) equivalent.

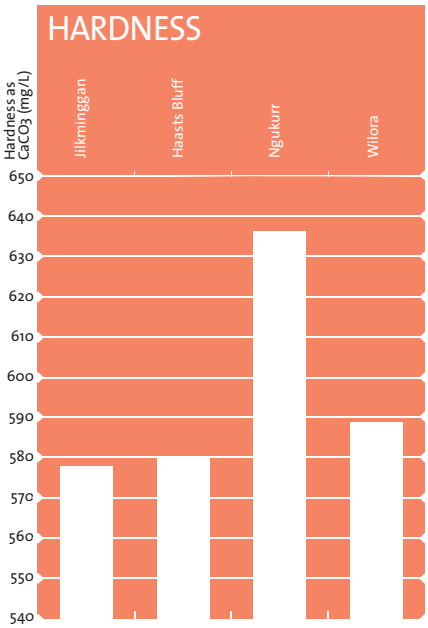
High hardness usually requires more soap to achieve lather and may lead to excessive scaling in hot water pipes and fittings. Soft water, or water low in total calcium and magnesium ions, may also cause corrosion in pipes, although this will depend on other physical and chemical characteristics such as pH, alkalinity, and dissolved oxygen. The ADWG recommend hardness levels below 200mg/L to minimise scaling in hot water systems.

The ADWG describe various degrees of hardness as:

<60mg/L $CaCO_3$	soft but possibly corrosive
60-200mg/L $CaCO_3$	good quality
200-500mg/L $CaCO_3$	increasing scaling problems
>500mg/L $CaCO_3$	severe scaling

Hard water, or water with calcium carbonate levels above 500mg/L (refer to following figure) may lead to excessive scaling of pipes and fittings, which can impact on infrastructure service life and indirectly impact health through impeding access to water.

Communities identified with average hardness levels greater then 500mg/L in drinking water

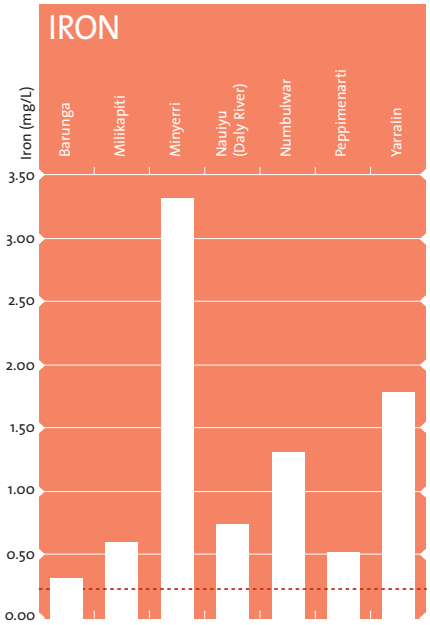


Iron has a taste threshold of about 0.3mg/L in water and becomes objectionable above 3mg/L. High iron concentrations give water an undesirable rust-brown appearance and can cause staining of laundry and plumbing fittings, fouling of ion-exchange softeners, and blockages in irrigation systems. Growths of iron bacteria, which concentrate iron, may cause taste and odour problems and lead to pipe restrictions, blockages and corrosion. The concentration of iron at the customer tap can also be affected by factors such as rusting iron pipes.

There are a number of communities regularly monitored for iron levels above 0.3mg/L and a limited number above 1mg/L (refer to figure on following page). Power and Water has identified alternative groundwater sources for Nauiyu (Daly River) and expect to equip some of these in 2010-11 to reduce the iron levels.

Options to reduce iron levels in the other communities with high levels are being investigated. Short-term solutions to reduce iron levels such as blending water supplies are being trialled.

Communities with an average iron concentration greater than 0.3mg/L in the distribution system



pH

The ADWG recommend that pH levels in drinking water should be between 6.5-8.5 pH units. Levels below 6.5 pH units are likely to cause corrosion of pipes and fittings while levels above 8.5 pH units can cause scaling particularly on hot water systems.

pH is a measure of the hydrogen ion concentration of water. It is measured on a logarithmic scale from 0 to 14. A pH of 7 is neutral, greater than 7 is alkaline, and less than 7 is acidic.

Sodium

Sodium is an essential element for humans, although there is currently no agreement on the minimum amount required. The sodium ion is widespread in water due to the high solubility of sodium salts and the abundance of mineral deposits. The ADWG recommend a trigger value of 180mg/L, when the taste becomes appreciable.

Total Dissolved Solids (Salinity)

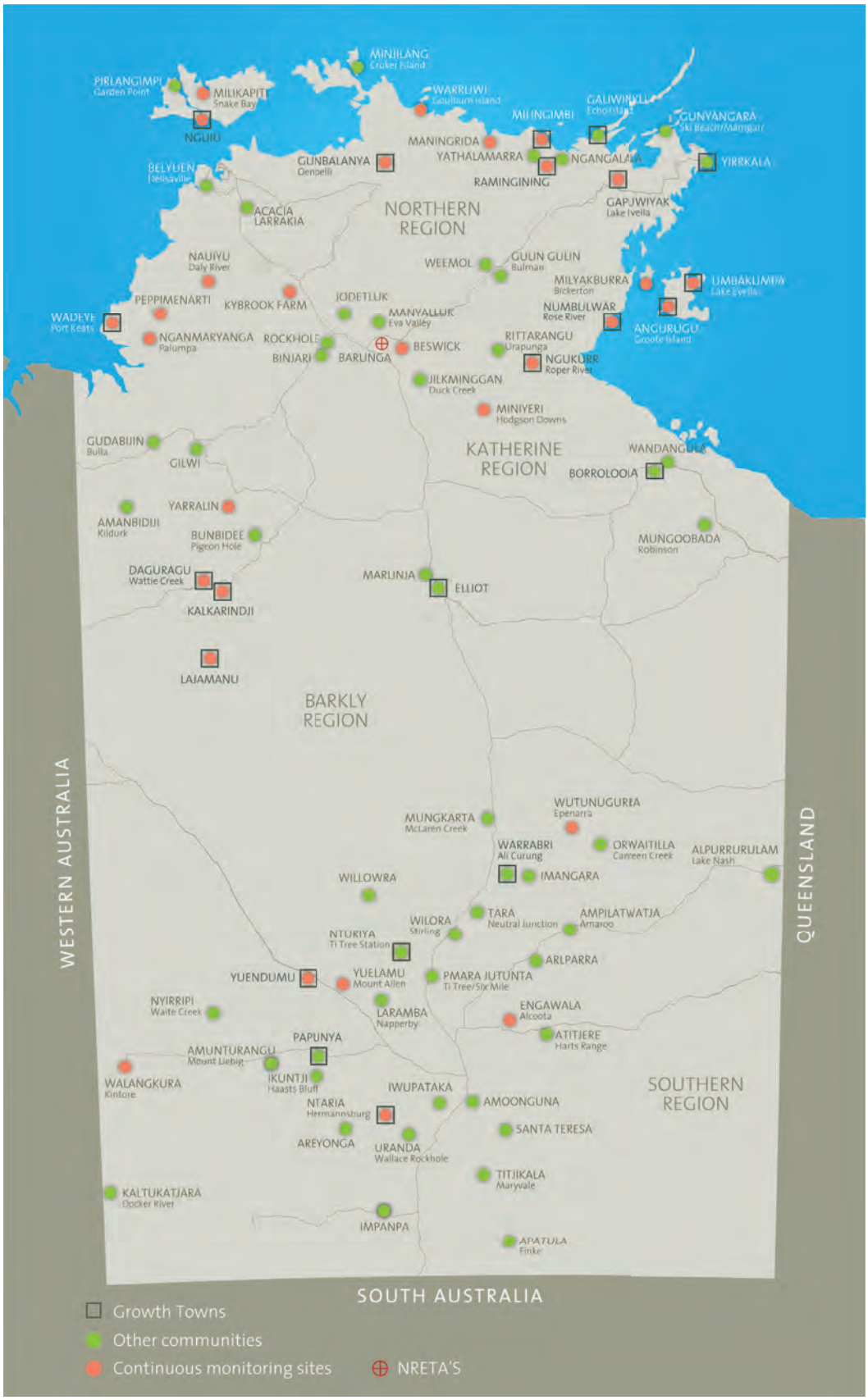
Total dissolved solids (TDS) are small organic and inorganic particles dissolved in water that can affect how the water tastes. TDS comprise sodium, potassium, calcium, magnesium, chloride, sulphate, bicarbonate, carbonate, silica, organic matter, fluoride, iron, manganese, nitrate and phosphate.

Water with low TDS can taste flat, while water with TDS above 500mg/L will affect taste and could cause scaling in taps, pipes, and hot water systems. Levels greater than 800mg/L significantly affect taste and may also cause moderate to severe scaling. Based on taste, the ADWG recommends TDS levels should be below 500mg/L. The ADWG provide guidance in the palatability of drinking water according to TDS concentration:

<800mg/L	Excellent quality for most domestic users;
80-500mg/L	Good quality;
500-800mg/L	Fair quality;
800-1000mg/L	Poor quality; and
>1000mg/L	May increase scaling, corrosion and taste.

Appendix E

Map of groundwater monitoring installation sites



Appendix F

Detailed summary of community water test results

Northern Region *(Table 1 of 3)*

	Reported unit	ADWG 2004	Acacia Larrakeyah	Angurugu [3,4]	Belyuen	Galiwinku (Elcho Island)	Gapuwiyak (Lake Evella)	Gunbalanya (Oenpelli)	Gunyangara (Marngarr)
Health Characteristics[2]									
E.coli detections	per year	0	0	**3**	0	0	0	1	0
E.coli performance	%	98	100	**97**	100	100	100	99	100
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.007	0.0010	0.0005 [5]	0.0008 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]
Barium	mg/L	0.7	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]
Boron	mg/L	4	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	1.5	0.1 [5]	0.1 [5]	0.2 [5]	0.1 [5]	0.1 [5]	0.1 [5]	0.1 [5]
Lead	mg/L	0.01	0.001 [5]	0.004	0.001 [5]	0.001 [5]	0.005	0.001 [5]	0.001 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [5]	0.006 [5]	0.003 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	1 [5]	2	1 [5]	1 [5]	3	1 [5]	1 [5]
Annual Exposure to Radioactivity	mSv/yr	1	0.10 [5]	0.08	0.18	0.10 [5]	0.11 [5]	0.11 [5]	0.12 [5]
Selenium	mg/L	0.1	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.02	0.00041	0.00003	0.00083	0.00002	0.00002	0.00003	0.00001 [5]
Aesthetic Characteristics[2]									
Aluminum	mg/L	0.2	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.14	0.02 [5]
Chloride	mg/L	250	6	11	10 [5]	11	11	7 [5]	13
Copper	mg/L	2	0.01 [5]	0.06	0.05 [5]	0.02 [5]	0.05	0.01 [5]	0.01 [5]
Hardness	CaCO3 mg/L	200	**228**	5	14 [5]	6	8	5	6
Iodine	mg/L	0.15	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01	0.01 [5]	0.01
Iron	mg/L	0.3	0.02 [5]	0.02 [5]	0.07	0.02 [5]	0.03 [5]	0.25	0.03 [5]
Manganese	mg/L	0.1	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.008 [5]	0.005 [5]
pH	pH Units	6.5-8.5	8.2	7.1	**6.3**	**5.7**	**6.1**	**5.9**	6.8
Sodium	mg/L	180	4	32	8	7	8	3	8
Sulfate	mg/L	250	1	1	0	1	0	1	0
Total Dissolved Solids	mg/L	500	237	105	63	41	55	121	8
True Colour	CU	15	3 [5]	2	3 [5]	4	3 [5]	6	2 [5]
Turbidity	NTU	5	1.3	0.2	1.3	0.5	1.5	3.6	1.6
Zinc	mg/L	3	0.01 [5]	0.10	0.02	0.01 [5]	0.02	0.02 [5]	0.03 [5]
Other Characteristics[2]									
Alkalinity	mg/L	#	200	61	16 [5]	20 [5]	20 [5]	20 [5]	20 [5]
Beryllium	mg/L	#	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	#	0.015	0.014	0.009	0.033	0.014	0.018	0.036
Calcium	mg/L	#	45	3	4	1	2	1	1
Conductivity	µS/cm	#	441	148	61	55	56	31	54
Magnesium	mg/L	#	28.5	0.7	0.5 [5]	0.7	0.9	0.6	0.5
Potassium	mg/L	#	1.7	0.1	3.6	0.8	0.1 [5]	0.2	0.1 [5]
Silica	mg/L	#	21	12	35	14	12	12	11
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Northern Region *(Table 2 of 3)*

	Reported unit	Maningrida [3,4]	Milikapiti (Snake Bay)	Milingimbi	Milyakburra (Bickerton Island)	Minjilang (Crocker Island)	Nauiyu Nambiyu (Daly River)	Nganmarriyanga (Palumpa) [4]	Numbulwar
Health Characteristics[2]									
E.coli detections	per year	0	0	0	0	0	0	0	0
E.coli performance	%	100	100	100	100	100	100	100	100
Antimony	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0005 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0059	0.0005 [5]	0.0010
Barium	mg/L	0.05 [5]	0.05	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.30
Boron	mg/L	0.02	0.02 [5]	0.04	0.04	0.02	0.02	0.02 [5]	0.04
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	0.1 [5]	0.1 [5]	0.1 [5]	0.1 [5]	0.1 [5]	0.4	0.2 [5]	0.2
Lead	mg/L	0.001 [5]	0.002 [5]	0.002 [5]	0.004	0.002 [5]	0.002 [5]	0.001 [5]	0.001 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	1 [5]	1 [5]	5	1 [5]	1 [5]	2 [5]	1 [5]	1 [5]
Annual Exposure to Radioactivity	mSv/yr	0.12 [5]	0.12 [5]	0.16 [5]	0.12 [5]	0.13 [5]	0.15 [5]	0.12 [5]	0.13 [5]
Selenium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.00005	0.00001 [5]	0.00017	0.00003	0.00010	0.00011	0.00001 [5]	0.00003
Aesthetic Characteristics[2]									
Aluminum	mg/L	0.02 [5]	0.04 [5]	0.05	0.02 [5]	0.12	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	9	15 [5]	106	47	18	8 [5]	24	29
Copper	mg/L	0.01 [5]	0.02 [5]	0.03 [5]	0.06	0.02 [5]	0.01 [5]	0.02	0.01 [5]
Hardness	$CaCO_3$ mg/L	6	21	52	20	10	125	55	**204**
Iodine	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.03	0.01 [5]	0.01 [5]
Iron	mg/L	0.03 [5]	**0.60** [5]	0.03 [5]	0.04 [5]	0.09 [5]	**0.75**	0.12	**1.31**
Manganese	mg/L	0.005 [5]	0.006 [5]	0.013 [5]	0.035	0.005 [5]	**0.811**	0.005 [5]	**0.125**
pH	pH Units	**6.1**	**5.7**	**5.4**	**5.6**	**5.1**	7.7	7.2	8.3
Sodium	mg/L	5	8	58	29	12	19	32	22
Sulfate	mg/L	1	1	12	4	4	5	9	36
Total Dissolved Solids	mg/L	37	58	218	141	54	182	162	284
True Colour	CU	2	4 [5]	2 [5]	2 [5]	3 [5]	3 [5]	6	6
Turbidity	NTU	0.9	4.0	1.2	1.6	2.6	**20.5**	2.3	**12.0**
Zinc	mg/L	0.01 [5]	0.05 [5]	0.03	0.06	0.12	0.04 [5]	0.01	0.01 [5]
Other Characteristics[2]									
Alkalinity	mg/L	14	20 [5]	20 [5]	20 [5]	18 [5]	183	86 [5]	172
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.028	0.022	0.202	0.173	0.070	0.022	0.012	0.070
Calcium	mg/L	1	8	10	5	3	28	16	62
Conductivity	µS/cm	44	59	415	192	94	328	269	502
Magnesium	mg/L	0.7	0.5 [5]	6.8	2.1	0.8	13.7	3.7	12.0
Potassium	mg/L	1.0	0.6 [5]	0.9	0.3	0.2 [5]	0.8	4.1 [5]	2.6
Silica	mg/L	14	13	19	16	13	40	31	18
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*

[3] *represents a single reticulation value*

[4] *value includes data from 2007-2010*

[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*

NA Not Available

Northern Region *(Table 3 of 3)*

	Reported unit	Peppimenarti [4]	Pirlangimpi (Garden Point) [4]	Ramingining	Umbakumba	Wadeye	Warruwi	Wurruniyanga (Nguiu) [4]	Yirrkala [4]
Health Characteristics[2]									
E.coli detections	per year	0	0	**1**	0	0	0	0	0
E.coli performance	%	100	100	**97**	100	100	100	100	100
Antimony	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0005 [5]	0.0005	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]
Barium	mg/L	0.08	0.08 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]
Boron	mg/L	0.02	0.02 [5]	0.02 [5]	0.02	0.02 [5]	0.02	0.02 [5]	0.02 [5]
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	0.5	0.1	0.1 [5]	0.1 [5]	0.1 [5]	0.1 [5]	0.1 [5]	0.1 [5]
Lead	mg/L	0.002	0.002 [5]	0.003 [5]	0.003	0.001 [5]	0.002 [5]	0.001	0.002 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.005 [5]	0.002 [5]	0.003 [5]	0.002 [5]	0.003 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	1 [5]	1	1 [5]	1 [5]	1 [5]	1 [5]	1 [5]	1 [5]
Annual Exposure to Radioactivity	mSv/yr	0.13 [5]	0.10 [5]	0.09 [5]	0.13 [5]	0.09 [5]	0.11 [5]	0.13 [5]	0.12 [5]
Selenium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.00001	0.00004 [5]	0.00003	0.00001	0.00015	0.00005	0.00001	0.00012
Aesthetic Characteristics[2]									
Aluminum	mg/L	0.02 [5]	0.17	0.02 [5]	0.02 [5]	0.02 [5]	0.06	0.02 [5]	0.03 [5]
Chloride	mg/L	15	7	10	39	27	39	9 [5]	11
Copper	mg/L	0.03	1.07 [5]	0.02 [5]	0.04 [5]	0.02 [5]	0.02 [5]	0.01 [5]	0.02 [5]
Hardness	$CaCO_3$ mg/L	67	7	14	19	5	24	13	7
Iodine	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Iron	mg/L	**0.53**	0.19	0.12 [5]	0.02 [5]	0.03 [5]	0.09 [5]	0.02 [5]	0.19 [5]
Manganese	mg/L	**0.185**	0.005 [5]	0.005 [5]	0.010 [5]	0.015 [5]	0.007 [5]	0.005 [5]	0.005 [5]
pH	pH Units	7.3	**6.2**	**5.7**	**5.9**	**5.8**	**5.1**	**6.1**	**5.9**
Sodium	mg/L	17	4	6	24	9	21	5	7
Sulfate	mg/L	3	0	0	4	1	8	0	2
Total Dissolved Solids	mg/L	127	24	59	116	29	86	31	25
True Colour	CU	4	5	2 [5]	3 [5]	4	2 [5]	2 [5]	2 [5]
Turbidity	NTU	4.9	**6.6**	1.4	1.9	3.5	1.6	0.9	**48.8**
Zinc	mg/L	0.10 [5]	0.04	0.02 [5]	0.03 [5]	0.03 [5]	0.03 [5]	0.03 [5]	0.01 [5]
Other Characteristics[2]									
Alkalinity	mg/L	94	4	20 [5]	20 [5]	20 [5]	20 [5]	19 [5]	15 [5]
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.025	0.013	0.008	0.070	0.022	0.076	0.010	0.020
Calcium	mg/L	17	3	4	3	1	4	5	2
Conductivity	µS/cm	223	28	46	160	65	159	41	56
Magnesium	mg/L	5.8	0.2	0.9	2.5	0.7	3.2	0.4	0.7
Potassium	mg/L	5.8	0.1	0.3	0.6	0.3	0.3 [5]	0.1	0.5
Silica	mg/L	27	11	15	10	13	11	14	12
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Katherine Region *(Table 1 of 3)*

	Reported unit	Amanbidji (Kildurk)	Barunga	Beswick	Binjari	Bunbidee (Pigeon Hole) [4]	Dagaragu	Gudabijin Bulla)
Health Characteristics[2]								
E.coli detections	per year	0	0	0	0	0	0	0
E.coli performance	%	100	100	100	100	100	100	100
Antimony	mg/L	0.0003	0.0002 [5]	**0.0067**	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0020	0.0005 [5]	0.0069	0.0015 [5]	0.0005	0.0013	0.0007
Barium	mg/L	0.20	0.05 [5]	0.15	0.20	0.05 [5]	0.08	**6.89**
Boron	mg/L	0.39	0.02 [5]	0.02	0.02	0.08	0.08	0.17
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	0.3	0.1 [5]	0.1 [5]	0.7	0.3	0.2	0.8
Lead	mg/L	0.001 [5]	0.001 [5]	0.001	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	1 [5]	1 [5]	1 [5]	1 [5]	20	2	1 [5]
Annual Exposure to Radioactivity	mSv/yr	0.12 [5]	0.11 [5]	0.12 [5]	0.90	0.12 [5]	0.16	0.17 [5]
Selenium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.00083	0.00002	0.00022	0.00106	0.00179	0.00140	0.00021
Aesthetic Characteristics[2]								
Aluminum	mg/L	0.04 [5]	0.05	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	128	10 [5]	7 [5]	33	29	18	60
Copper	mg/L	0.01 [5]	0.01 [5]	0.13	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Hardness	$CaCO_3$ mg/L	**381**	153	**301**	**268**	**312**	**252**	**258**
Iodine	mg/L	0.01	0.01 [5]	0.01 [5]	0.01 [5]	0.02	0.02	0.01 [5]
Iron	mg/L	0.02 [5]	0.31	0.02 [5]	0.12	0.02 [5]	0.02 [5]	0.04
Manganese	mg/L	0.012 [5]	0.005	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.006 [5]
pH	pH Units	7.8	6.7	7.4	7.9	7.3	7.8	8.4
Sodium	mg/L	151	7	5	21	26	26	34
Sulfate	mg/L	124	1	2	4	7	6	2
Total Dissolved Solids	mg/L	**819**	192	319	342	429	308	334
True Colour	CU	3 [5]	9	2	3 [5]	2 [5]	3 [5]	3 [5]
Turbidity	NTU	3.8	2.0	1.3	1.9	0.7	1.4	1.7
Zinc	mg/L	0.01 [5]	0.15	0.13	0.01 [5]	0.01 [5]	0.02 [5]	0.02 [5]
Other Characteristics[2]								
Alkalinity	mg/L	466	160	300	300	355	300	283
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.157	0.013	0.015	0.052	0.068	0.089	0.114
Calcium	mg/L	57	29	57	54	69	48	33
Conductivity	µS/cm	1406	320	599	634	705	592	674
Magnesium	mg/L	57.9	19.4	38.9	34.4	34.0	32.4	42.5
Potassium	mg/L	3.7	1.4	2.0	5.7	2.1	4.0	5.8
Silica	mg/L	34	21	23	23	57	26	19
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*

[3] *represents a single reticulation value*

[4] *value includes data from 2007-2010*

[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*

NA Not Available

Katherine Region *(Table 2 of 3)*

	Reported unit	Gulin Gulin (Bulman) [4]	Jilkminngan (Duck Creek)	Jodetluk (Gorge Camp)	Kalkarindji (Wave Hill)	Kybrook Farm	Lajamanu	Manyalalluk (Eva Valley) [4]
Health Characteristics[2]								
E.coli detections	per year	0	0	0	0	0	0	0
E.coli performance	%	100	100	100	100	100	100	100
Antimony	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0005 [5]	0.0007	0.0005 [5]	0.0013	**0.0115**	0.0006 [5]	0.0005 [5]
Barium	mg/L	0.05 [5]	0.05 [5]	0.05 [5]	0.11	0.05 [5]	0.10	0.05 [5]
Boron	mg/L	0.02	0.39	0.02 [5]	0.12	0.02 [5]	0.20	0.02 [5]
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	0.1	0.5	0.1 [5]	0.3	0.6	0.4	0.1 [5]
Lead	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.002 [5]	0.001 [5]	0.001 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	1 [5]	1 [5]	1 [5]	5	1 [5]	8	1 [5]
Annual Exposure to Radioactivity	mSv/yr	0.12 [5]	0.52	NA	0.21 [5]	0.12 [5]	0.17 [5]	0.14 [5]
Selenium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.002	0.001 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.00026	0.01031	0.00001 [5]	0.00181	0.00029	0.00229	0.00007
Aesthetic Characteristics[2]								
Aluminum	mg/L	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.05 [5]	0.02 [5]	0.02
Chloride	mg/L	11	**252**	8	29	11 [5]	125	8
Copper	mg/L	0.01 [5]	0.04 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.02 [5]	0.03 [5]
Hardness	$CaCO_3$ mg/L	**316**	**571**	6	**276**	133	**266**	8
Iodine	mg/L	0.01 [5]	**0.18**	0.01 [5]	0.02	0.01 [5]	**0.18**	0.01 [5]
Iron	mg/L	0.03 [5]	0.09	0.02 [5]	0.02 [5]	0.16 [5]	0.05 [5]	0.26 [5]
Manganese	mg/L	0.005 [5]	0.046	0.005 [5]	0.005 [5]	**0.110** [5]	0.005 [5]	0.005 [5]
pH	pH Units	7.8	7.3	7.3	8.0	6.9	7.6	**5.1**
Sodium	mg/L	8	**188**	6	37	44	96	3
Sulfate	mg/L	1	220	0	12	3	60	0
Total Dissolved Solids	mg/L	333	**1260**	34	366	252	**622**	43
True Colour	CU	3 [5]	4	5	2 [5]	7 [5]	2 [5]	2 [5]
Turbidity	NTU	0.3	1.4	1.2	1.4	3.8	2.3	0.8
Zinc	mg/L	0.02 [5]	0.01 [5]	0.05	0.01 [5]	0.02 [5]	0.02	0.04
Other Characteristics[2]								
Alkalinity	mg/L	351	508	20 [5]	300	203	264	17 [5]
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.022	1.531	0.009	0.108	0.027	0.870	0.026
Calcium	mg/L	62	88	1	55	19	39	2
Conductivity	µS/cm	620	2026	45	689	424	999	29
Magnesium	mg/L	40.1	86.5	1.0	33.5	21.2	40.8	0.6
Potassium	mg/L	2.5	25.7	0.5	4.6	1.4	8.5	0.4
Silica	mg/L	24	55	16	25	49	100	23
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Katherine Region *(Table 3 of 3)*

	Reported unit	Minyerri (Crocker Island)	Mungoobada (Robinson River)	Ngukurr	Rittarangu	Weemol [4]	Yarralin
Health Characteristics[2]							
E.coli detections	per year	0	0	1	0	**1**	0
E.coli performance	%	100	100	99	100	**97**	100
Antimony	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0045	0.0005 [5]	0.0005 [5]	0.0005	0.0005 [5]	0.0047
Barium	mg/L	0.33	**1.10**	**0.79**	0.15	0.05 [5]	**1.09**
Boron	mg/L	0.20	0.12	0.08	0.04	0.03	0.10
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	0.3	0.9	0.2	0.1	0.1	0.1
Lead	mg/L	0.001 [5]	0.002 [5]	0.002 [5]	0.001 [5]	0.001 [5]	0.002 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	1 [5]	3 [5]	1 [5]	3	1 [5]	1 [5]
Annual Exposure to Radioactivity	mSv/yr	0.14 [5]	0.13 [5]	0.15 [5]	0.12 [5]	0.12 [5]	0.14 [5]
Selenium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.00001 [5]	0.00232	0.00172	0.00085	0.00030	0.00091
Aesthetic Characteristics[2]							
Aluminum	mg/L	0.02 [5]	0.03 [5]	0.10 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	15 [5]	29	**399**	63	11	45
Copper	mg/L	0.01 [5]	0.02 [5]	0.05 [5]	0.02 [5]	0.02 [5]	0.01 [5]
Hardness	$CaCO_3$ mg/L	105	**488**	**624**	**265**	**352**	**384**
Iodine	mg/L	0.01 [5]	0.02	0.02	0.01	0.01 [5]	0.06
Iron	mg/L	**3.31**	0.10 [5]	0.28	0.02 [5]	0.02 [5]	**1.79**
Manganese	mg/L	**0.320**	0.013 [5]	0.014 [5]	0.005 [5]	0.005 [5]	**0.105**
pH	pH Units	7.4	7.4	7.5	7.6	7.5	7.6
Sodium	mg/L	26	21	100	27	10	39
Sulfate	mg/L	11	6	38	2	0	5
Total Dissolved Solids	mg/L	177	**542**	**981**	378	387	**521**
True Colour	CU	5 [5]	3 [5]	4 [5]	2 [5]	4 [5]	4 [5]
Turbidity	NTU	**51.7**	2.4	**5.0**	0.4	0.3	**6.8**
Zinc	mg/L	0.03 [5]	0.04 [5]	0.04 [5]	0.02 [5]	0.01	0.11
Other Characteristics[2]							
Alkalinity	mg/L	119	532	319	300	389	463
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.036	0.472	0.975	0.204	0.028	0.204
Calcium	mg/L	23	41	109	49	63	67
Conductivity	µS/cm	331	993	1832	732	694	933
Magnesium	mg/L	12.0	93.3	88.6	34.9	47.5	52.6
Potassium	mg/L	5.3	3.9	6.7	2.3	2.8	3.4
Silica	mg/L	31	34	26	24	34	44
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*

[3] *represents a single reticulation value*

[4] *value includes data from 2007-2010*

[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*

NA Not Available

Barkly Region

	Reported unit	Alpurrurulam (Lake Nash)	Imangara (Murray Downs) [4]	Nturiya	Owaitilla (Canteen Creek)	Tara	Warrabri Ali Curung)	Willowra	Wilora (Stirling)	Wutunugurra (Epenarra)
Health Characteristics[2]										
E.coli detections	per year	0	0	0	0	0	0	0	0	0
E.coli performance	%	100	100	100	100	100	100	100	100	100
Antimony	mg/L	0.0002 [5]	0.0002 [5]	0.0002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0015	0.0010	0.0005 [5]	0.0005 [5]	0.0006 [5]	0.0026	0.0018	0.0015	0.0005 [5]
Barium	mg/L	0.10	0.50	0.05 [5]	0.10	0.05 [5]	0.10	0.05	0.05 [5]	0.50
Boron	mg/L	0.25	0.25	0.57	0.22	0.44	0.73	0.45	0.71	0.10
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	**1.5**	0.7	1.0	0.5	0.9	**2.1**	0.8	0.9	0.2
Lead	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.002 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.010	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	3	9	35	9	24	**80**	36	17	4
Annual Exposure to Radioactivity	mSv/yr	0.26	0.71	0.5	0.41	0.61	0.81	0.83	0.58	0.22 [5]
Selenium	mg/L	0.002 [5]	0.001 [5]	0.003	0.001	0.002	0.003	0.004 [5]	0.005	0.001 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.01045	0.01203	0.01417	0.00115	0.00392	0.01190	**0.02538**	**0.02078**	0.00205
Aesthetic Characteristics[2]										
Aluminum	mg/L	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.03 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	187	25	**330**	83	**333**	197	175	**497**	42
Copper	mg/L	0.01 [5]	0.01 [5]	0.02 [5]	0.02 [5]	0.06 [5]	0.06 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Hardness	$CaCO_3$ mg/L	**438**	152	**285**	165	**326**	**245**	**247**	**562**	179
Iodine	mg/L	**0.17**	0.10	**0.32**	0.13	**0.32**	**0.28**	**0.25**	**0.40**	0.07
Iron	mg/L	0.02 [5]	0.04 [5]	0.04 [5]	0.02 [5]	0.07 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Manganese	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.020 [5]
pH	pH Units	7.6	8.0	7.5	7.0	7.0	8.1	8.0	7.9	7.5
Sodium	mg/L	138	30	**208**	74	**212**	**208**	136	**284**	30
Sulfate	mg/L	85	12	170	33	150	92	79	220	11
Total Dissolved Solids	mg/L	**914**	440	**1125**	420	**1067**	**963**	**748**	**1683**	321
True Colour	CU	3 [5]	2 [5]	4 [5]	4	2 [5]	4 [5]	2 [5]	7 [5]	3 [5]
Turbidity	NTU	1.5	0.2	0.7 [5]	0.4	1.3	1.1 [5]	1.2	0.9 [5]	1.0
Zinc	mg/L	0.01 [5]	0.01 [5]	0.02	0.01 [5]	0.06	0.01 [5]	0.04	0.01	0.03
Other Characteristics[2]										
Alkalinity	mg/L	480	336	207	190	200	377	277	391	200
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.779	0.107	1.680	0.407	1.600	0.998	0.777	2.983	0.198
Calcium	mg/L	56	39	60	26	39	32	48	91	40
Conductivity	µS/cm	1534	733	1816	738	1700	1621	1252	2600	555
Magnesium	mg/L	72.4	38.6	34.2	24.4	55.5	40.0	30.8	84.3	19.3
Potassium	mg/L	7.0	29.5	23.5	12.0	27.7	50.1	32.3	57.0	7.6
Silica	mg/L	64	80	71	57	21	59	84	87	61
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Southern Region *(Table 1 of 3)*

	Reported unit	Ampilawatja (Ammarroo)	Amunturangu (Mt Liebig)	Apatula (Finke)	Areyonga	Atitjere (Harts Range)	Engawala (Alcoota)	Ikuntji (Haasts Bluff)
Health Characteristics[2]								
E.coli detections	per year	0	0	0	0	0	0	0
E.coli performance	%	100	100	100	100	100	100	100
Antimony	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.0005 [5]	0.0008 [5]	0.0005	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]
Barium	mg/L	0.05 [5]	0.05	0.10	0.10	0.05	0.15	0.05 [5]
Boron	mg/L	0.28	0.27	0.08	0.18	0.14	0.06	0.33
Cadmium	mg/L	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Flouride	mg/L	1.1	1.2	0.2	0.4	0.5	0.5	0.5
Lead	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.002 [5]	0.001 [5]	0.004 [5]
Mercury	mg/L	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.002 [5]	0.002 [5]	0.002 [5]	0.013	0.002 [5]	0.002 [5]	0.004 [5]
Nitrate	mg/L	27	20	9	9	32	10	8
Annual Exposure to Radioactivity	mSv/yr	0.44	0.28	0.21	0.37	0.20	0.15 [5]	0.60
Selenium	mg/L	0.002 [5]	0.002	0.001 [5]	0.002 [5]	0.002	0.001	0.002 [5]
Silver	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.00833	0.00548	0.00241	0.00661	0.00694	0.00206	0.01010
Aesthetic Characteristics[2]								
Aluminum	mg/L	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	167	115	146	110	118	47	**370**
Copper	mg/L	0.01 [5]	0.02 [5]	0.02 [5]	0.01 [5]	0.03	0.02 [5]	0.05 [5]
Hardness	$CaCO_3$ mg/L	**398**	**258**	177	**409**	**273**	**301**	**576**
Iodine	mg/L	**0.17**	**0.20**	0.03	0.12	0.10	0.06	**0.26**
Iron	mg/L	0.08 [5]	0.09	0.02 [5]	0.03 [5]	0.09	0.02 [5]	0.05 [5]
Manganese	mg/L	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
pH	pH Units	7.9	7.6	7.7	7.9	8.1	7.6	7.6
Sodium	mg/L	111	95	85	56	110	42	160
Sulfate	mg/L	217	87	56	76	135	20	**256**
Total Dissolved Solids	mg/L	**1046**	**603**	461	**650**	**730**	472	**1273**
True Colour	CU	2 [5]	2 [5]	3 [5]	2 [5]	4 [5]	4	4 [5]
Turbidity	NTU	0.5 [5]	2.4	0.8	1.0	1.0	**13.2**	1.8
Zinc	mg/L	0.01 [5]	0.04	0.21	0.02 [5]	0.04	0.03	0.22
Other Characteristics[2]								
Alkalinity	mg/L	297	250	122	325	210	330	244
Beryllium	mg/L	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Bromine	mg/L	0.927	0.458	0.322	0.396	0.539	0.284	1.618
Calcium	mg/L	91	56	53	74	43	70	109
Conductivity	µS/cm	1484	1009	867	1108	1104	816	1986
Magnesium	mg/L	51.9	28.8	13.0	54.7	40.3	30.8	73.8
Potassium	mg/L	22.7	13.8	6.4	8.3	8.7	5.0	29.1
Silica	mg/L	38	51	16	19	35	64	54
Tin	mg/L	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Southern Region *(Table 2 of 3)*

	Reported unit	Imanpa	Kaltukatjara (Docker River)	Laramba (Napperby) 4	Ntaria (Hermmansburg)	Nyirripi	Papunya	Pmara Jutunta (Ti Tree 6 Mile)
Health Characteristics[2]								
E.coli detections	per year	0	0	**2**	0	0	0	0
E.coli performance	%	100	100	**94**	100	100	100	100
Antimony	mg/L	0.0002[5]	0.0008[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]
Arsenic	mg/L	0.0005[5]	0.0010[5]	0.0010	0.0005[5]	0.0016	0.0005[5]	0.0010
Barium	mg/L	0.05[5]	0.05	0.20	0.05[5]	0.09[5]	0.10	0.10
Boron	mg/L	0.75	0.15	0.36	0.14	0.34	0.30	0.33
Cadmium	mg/L	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]
Chromium	mg/L	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]
Flouride	mg/L	0.8	0.4	1.1	0.3	**1.6**	1.0	0.8
Lead	mg/L	0.001[5]	**0.055**	0.001[5]	0.002[5]	0.001[5]	0.001[5]	0.001[5]
Mercury	mg/L	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]
Molybdenum	mg/L	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]
Nickel	mg/L	0.003	0.002[5]	0.002[5]	0.002[5]	0.003[5]	0.003[5]	0.002[5]
Nitrate	mg/L	28	1[5]	36	6	26	20	**50**
Annual Exposure to Radioactivity	mSv/yr	0.83	0.20	0.95	0.19[5]	0.40	0.23[5]	0.25
Selenium	mg/L	0.004	0.001[5]	0.002	0.001[5]	0.002[5]	0.007	0.002[5]
Silver	mg/L	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]
Uranium	mg/L	0.01142	0.00001[5]	**0.02895**	0.00437	0.00870	0.00994	0.00787
Aesthetic Characteristics[2]								
Aluminum	mg/L	0.02[5]	0.02[5]	0.02[5]	0.02[5]	0.02[5]	0.02[5]	0.02[5]
Chloride	mg/L	**390**	87	101	111	96	207	65
Copper	mg/L	0.01[5]	0.55[5]	0.02[5]	0.02	0.02[5]	0.02[5]	0.01[5]
Hardness	$CaCO_3$ mg/L	**418**	**273**	**272**	**286**	**231**	**250**	195
Iodine	mg/L	**0.63**	0.10	**0.35**	0.08	**0.18**	**0.28**	0.13
Iron	mg/L	0.04	0.09	0.03[5]	0.22	0.02[5]	0.03[5]	0.02[5]
Manganese	mg/L	0.005[5]	0.010	0.005[5]	0.010[5]	0.005[5]	0.005[5]	0.005[5]
pH	pH Units	8.3	8.2	7.9	7.7	8.1	8.1	8.0
Sodium	mg/L	**239**	56	77	55	85	**229**	65
Sulfate	mg/L	234	66	36	56	37	83	34
Total Dissolved Solids	mg/L	**1300**	477	**649**	485	**573**	**944**	**504**
True Colour	CU	6[5]	2[5]	3[5]	3	2[5]	3[5]	5[5]
Turbidity	NTU	3.8	1.5	0.3	3.3	2.2	0.7	1.5
Zinc	mg/L	0.48	0.06	0.01[5]	0.05	0.02[5]	0.02	0.01[5]
Other Characteristics[2]								
Alkalinity	mg/L	203	245	306	230	286	400	206
Beryllium	mg/L	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]
Bromine	mg/L	2.044	0.529	0.591	0.564	0.453	1.355	0.395
Calcium	mg/L	78	51	55	56	44	50	44
Conductivity	µS/cm	2086	846	1019	902	948	1588	780
Magnesium	mg/L	54.3	35.4	32.4	35.3	29.3	30.5	21.0
Potassium	mg/L	29.7	11.3	38.3	7.5	26.8	11.0	17.9
Silica	mg/L	28	12	96	16	90	67	95
Tin	mg/L	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Southern Region *(Table 3 of 3)*

	Reported unit	Santa Teresa	Titjikala (Maryvale)	Walangkula (Kintore)	Wallace Rockhole	Yuelamu (Mt Allan)	Yuendumu
Health Characteristics[2]							
E.coli detections	per year	0	**1**	**1**	0	**1**	0
E.coli performance	%	100	**97**	**94**	100	**97**	100
Antimony	mg/L	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]
Arsenic	mg/L	0.0005[5]	0.0010	0.0010	0.0006[5]	0.0008	0.0005[5]
Barium	mg/L	0.50	0.31	0.05[5]	0.05[5]	0.06[5]	0.05[5]
Boron	mg/L	0.04	0.10	0.29	0.34	0.10	0.31
Cadmium	mg/L	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]	0.0002[5]
Chromium	mg/L	0.005[5]	0.005[5]	0.005[5]	0.026	0.005[5]	0.005[5]
Flouride	mg/L	0.2	0.5	0.7	0.8	0.5	0.7
Lead	mg/L	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]
Mercury	mg/L	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]	0.0001[5]
Molybdenum	mg/L	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.005[5]
Nickel	mg/L	0.002[5]	0.002[5]	0.002[5]	0.002[5]	0.002[5]	0.002[5]
Nitrate	mg/L	15	16	**77**	16	1[5]	4
Annual Exposure to Radioactivity	mSv/yr	0.45	0.26	0.13[5]	0.35	0.16	0.50[5]
Selenium	mg/L	0.003	0.001[5]	0.004	0.004	0.001[5]	0.002[5]
Silver	mg/L	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]
Uranium	mg/L	0.00529	0.00322	0.00158	0.00513	0.00757	0.00609
Aesthetic Characteristics[2]							
Aluminum	mg/L	0.02[5]	0.02[5]	0.02[5]	0.02[5]	0.08	0.02[5]
Chloride	mg/L	11	31	116	153	49	148
Copper	mg/L	0.01[5]	0.02	0.23[5]	0.02[5]	0.02[5]	0.06[5]
Hardness	$CaCO_3$ mg/L	**248**	**202**	**456**	**271**	92	**260**
Iodine	mg/L	0.02	0.04	0.14	0.14	0.06	**0.26**
Iron	mg/L	0.02[5]	0.02[5]	0.04[5]	0.12	0.05	0.11[5]
Manganese	mg/L	0.005[5]	0.005[5]	0.005[5]	0.005[5]	0.009	0.009[5]
pH	pH Units	7.8	7.6	7.5	7.6	8.0	7.9
Sodium	mg/L	6	34	92	94	52	110
Sulfate	mg/L	11	16	64	72	73	106
Total Dissolved Solids	mg/L	322	316	**841**	**582**	254	**618**
True Colour	CU	2[5]	3[5]	2[5]	3[5]	6[5]	2[5]
Turbidity	NTU	0.6	1.0	0.9	1.4	2.9	2.4
Zinc	mg/L	0.01	0.06	0.02[5]	0.15	0.04	0.04
Other Characteristics[2]							
Alkalinity	mg/L	260	210	397	220	81	222
Beryllium	mg/L	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]	0.001[5]
Bromine	mg/L	0.041	0.122	1.074	0.411	0.263	0.810
Calcium	mg/L	63	57	72	62	26	54
Conductivity	µS/cm	563	588	1331	1075	471	1014
Magnesium	mg/L	22.0	14.6	67.0	28.0	6.6	30.6
Potassium	mg/L	4.8	4.5	5.1	9.6	4.8	14.5
Silica	mg/L	17	32	87	14	4	16
Tin	mg/L	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]	0.01[5]

[2] *represents the average value*
[3] *represents a single reticulation value*
[4] *value includes data from 2007-2010*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*
NA Not Available

Indigenous Essential Services Pty Limited
(ACN 105 269 636)

FINANCIAL STATEMENTS

For the Year Ended

30 June 2010

Indigenous Essential Services Pty Ltd
(ACN 105 269 636)
Financial Statements for the year ended 30 June 2010

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DIRECTORS' REPORT
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

The directors present their report together with the financial report of the Indigenous Essential Services Pty Limited (the Company) for the year ended 30 June 2010 and the auditor's report thereon.

Directors

The directors of the Company at any time during or since the end of the financial year were:

Ms Judith King	Director since 26 June 2003; Appointed Chairman 1 July 2007.
Mr Peter Vines	Director since 10 October 2005; Resigned on 8 October 2009.
Mr Barry Chambers	Director since 1 July 2007.
Mr Andrew Macrides	Director since 1 July 2007.
Mr Michael Hannon	Director since 1 August 2009.

Company Particulars
Indigenous Essential Services Pty Limited is an Australian proprietary company, incorporated and operating in Australia.

Principal Registered Office and Principal Place of Business:	Level 2 Mitchell Centre 55 Mitchell Street Darwin NT 0800
Company Secretary:	Mr Kelvin Strange

Principal Activities

The Company was formed on 26 June 2003 and commenced operations on 1 July 2003.

The principal activities of the Company during the course of the financial year were to provide electricity, water and sewerage services to remote indigenous communities in the Northern Territory.

Controlling Entity

The Company's controlling entity is the Power and Water Corporation, a government owned corporation pursuant to the *Government Owned Corporation Act 2001*. In this report, the controlling entity is referred to as Power and Water.

Operating and Financial Review

The Company's net profit for the period of $11,846,920 was slightly higher than last year's (2009: $10,352,298) principally due to additional capital funding received from the Northern Territory Government for works in relation to the Strategic Indigenous Housing and Infrastructure Program (SIHIP). Whilst the additional funding was received in 2008-2009, a large portion of the funding was utilised to carry out work during the course of the financial year

Changes in state of affairs

In the opinion of the directors, other than the matters mentioned above there were no significant changes in the state of affairs of the Company that occurred during the financial year under review.

Dividends

In accordance with the Company's Constitution, the Company paid no dividends during the financial year (2009: nil).

DIRECTORS' REPORT
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

Environmental Regulation

The Company's operations are subject to various environmental regulations under both Commonwealth and Territory legislations.

The Company regularly monitors compliance with environmental regulations. The directors are not aware of any significant breaches during the period covered by this report.

Events Subsequent to Reporting Date

There has not arisen in the interval between the end of the financial year and the date of this report any item, transaction or event of a material or unusual nature likely, in the opinion of the directors of the Company, to affect significantly the operations of the Company, the results of those operations, or the state of affairs of the Company in future financial years.

Future Developments

At the date of this report, there are no developments in the operations of the Company that, in the opinion of the directors, are likely to significantly impact the Company during the 2011 financial year.

The service contract between the Company and the Northern Territory Government to construct and maintain assets required to provide electricity, water and sewerage services to remote Indigenous communities in the Northern Territory expired on 30 June 2010. The contract has been extended for a period of three years from 2010-2011 to 2012-2013. During the first six months of this extension, a review will be undertaken to establish the Northern Territory Government's longer term service delivery requirements.

Lead Auditor's Independence Declaration Under Section 307C of the *Corporations Act 2001*

The lead auditor's declaration of independence is set out on page 6 of the financial report.

Insurance Premiums

The following insurance policies were purchased by Power and Water to cover its directors and officers, and those of its subsidiaries. In accordance with normal commercial practices, under the terms of the insurance contracts, the nature of the liabilities insured against and the amount of premiums are confidential.

Group Personal Accident Insurance

Professional Indemnity Insurance

Directors' and Officers' Liability

This report is made in accordance with a resolution of Directors pursuant to s.298(2) of the Corporations Act 2001.

Ms Judith King
Director and Chairman

Mr Andrew Macrides
Managing Director

Dated at Darwin this 17TH day of September 2010

DIRECTORS' DECLARATION
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

In the opinion of the directors of Indigenous Essential Services Pty Limited ("the Company"):

(a) the financial statements and notes, set out on pages 8 to 21, are in accordance with the *Corporations Act 2001*, including:

  (i) giving a true and fair view of the financial position of the Company as at 30 June 2010 and its performance for the year ended on that date; and

  (ii) complying with Accounting Standards in Australia; and

(b) there are reasonable grounds to believe that the Company will be able to pay its debts as and when they become due and payable.

(c) the financial statements and notes thereto are in accordance with International Financial Reporting Standards issued by the International Accounting Standards Board

Signed in accordance with a resolution of directors made pursuant to s.295(5) of the Corporations Act 2001.

Judith King

Ms Judith King
Director and Chairman

Mr Andrew Macrides
Managing Director

Dated at Darwin this 17TH day of September 2010

Northern Territory Auditor-General's Office

Auditing for Parliament

indepltr10.doc

The Board of Directors
Indigenous Essential Services Pty Limited
Level 2, Mitchell Centre
55 Mitchell Street
Darwin NT 0800

16 September 2010

Dear Board Members,

Indigenous Essential Services Pty Limited

In accordance with section 307C of the *Corporations Act 2001*, I am pleased to provide the following declaration of independence to the directors of Indigenous Essential Services Pty Limited.

As auditor of the financial statements of Indigenous Essential Services Pty Limited for the financial year ended 30 June 2010, I declare that to the best of my knowledge and belief, there have been no contraventions of:

(i) the auditor independence requirements of the *Corporations Act 2001* in relation to the audit; and

(ii) any applicable code of professional conduct in relation to the audit.

Yours faithfully,

P McGuiness
Auditor-General for the Northern Territory

www.nt.gov.au/ago
nt.audit@nt.gov.au

GPO Box 4594
DARWIN NT 0801

Telephone (08) 8999 7155
Facsimile (08) 8999 7144

AUDITOR-GENERAL

Independent Auditor's Report to the Members of Indigenous Essential Services Pty Limited

Year ended 30 June 2010

Page 1 of 2

I have audited the accompanying financial report of Indigenous Essential Services Pty Limited, which comprises the statement of financial position as at 30 June 2010, and the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year ended on that date, a summary of significant accounting policies, other explanatory notes and the directors' declaration.

The Responsibility of the Directors for the Financial Report

The directors of the company are responsible for the preparation and fair presentation of the financial report in accordance with Australian Accounting Standards (including the Australian Accounting Interpretations) and the *Corporations Act 2001*. This responsibility includes establishing and maintaining internal controls relevant to the preparation and fair presentation of the financial report that is free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

Auditor's Responsibility

My responsibility is to express an opinion on the financial report based on my audit. I conducted my audit in accordance with Australian Auditing Standards. These Auditing Standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance whether the financial report is free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial report. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial report, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial report.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Auditor's Independence Declaration

In conducting my audit, I have complied with the independence requirements of the *Corporations Act 2001*. I confirm that the independence declaration required by the *Corporations Act 2001*, provided to the directors of Indigenous Essential Services Pty Ltd on 3 September 2010, would be in the same terms if provided to the directors as at the date of this auditor's report.

Level 12 Northern Territory House 22 Mitchell Street Darwin NT 0800 Tel: 08 8999 7155 Fax: 08 8999 7144

AUDITOR-GENERAL

Auditor's Opinion

In my opinion

(a) the financial report of Indigenous Essential Services Pty Limited is in accordance with the *Corporations Act 2001*, including:

   i. giving a true and fair view of the company's financial position as at 30 June 2010 and of its performance for the year ended on that date; and

   ii. complying with the Australian Accounting Standards (including the Australian Accounting Interpretations) and the *Corporations Regulations 2001*.

(b) the financial report also complies with International financial Reporting Standards as disclosed in Note 2(b).

F McGuiness
Auditor-General for the Northern Territory
Darwin, Northern Territory

17 September 2010

Level 12 Northern Territory House 22 Mitchell Street Darwin NT 0800 Tel: 08 8999 7155 Fax: 08 8999 7144

Statement of Comprehensive Income

Indigenous Essential Services Pty Limited for the year ended 30 June 2010

	Note	2010 $	2009 $
Continuing Operations			
Revenue from sale of goods	3 (a)	22,524,436	18,341,373
Revenue from rendering of services	3 (b)	69,525,695	71,988,334
Interest revenue		1,301,717	861,477
Other Income	3 (c)	4,995,605	11,722,823
Total revenue and income		98,347,453	102,914,007
Raw materials and consumables used		27,674,940	35,614,839
Depreciation and amortisation expenses		17,898,632	19,572,159
Other expenses	3 (d)	40,926,961	37,374,711
Profit for the year from continuing operations		11,846,920	10,352,298
Profit for the year		**11,846,920**	**10,352,298**
Total comprehensive income for the year		**11,846,920**	**10,352,298**
Profit attributable to Owner of the Company		11,846,920	10,352,298
Comprehensive income attributable to Owner of the Company		11,846,920	10,352,298

The statement of comprehensive income is to be read in conjunction with the notes to the financial statements.

Statement of Changes in Equity

Indigenous Essential Services Pty Limited for the year ended 30 June 2010

	Note	2010 $	2009 $
Equity at the beginning of the year		178,821,184	168,468,886
Net profit for the year		11,846,920	10,352,298
	10	190,668,104	178,821,184

The statement of changes in equity is to be read in conjunction with the notes to the financial statements.

Statement of Financial Position

Indigenous Essential Services Pty Ltd as at 30 June 2010

	Note	2010 $	2009 $
CURRENT ASSETS			
Cash and cash equivalents	4 (a)	36,872,953	42,619,169
Trade and other receivables	5	956,901	418,668
Inventories	6	4,719,833	3,864,382
Other assets		-	4,356
Total current assets		42,549,687	46,906,575
NON-CURRENT ASSETS			
Property, plant and equipment	7	186,586,436	175,066,843
Total non-current assets		186,586,436	175,066,843
Total assets		229,136,123	221,973,418
CURRENT LIABILITIES			
Trade and other payables	8	38,468,019	43,152,234
Total current liabilities		38,468,019	43,152,234
Total liabilities		38,468,019	43,152,234
Net assets		190,668,104	178,821,184
EQUITY			
Contributed equity	9	10	10
Retained earnings	10	190,668,094	178,821,174
Total equity		190,668,104	178,821,184

The statement of financial position is to be read in conjunction with the notes to the financial statements.

Statement of Cash Flows

Indigenous Essential Services Pty Limited for the year ended 30 June 2010

	Note	2010 $	2009 $
CASH FLOWS FROM OPERATING ACTIVITIES			
Receipts from customers		25,516,903	29,023,811
Payments to suppliers		(70,902,601)	(71,046,045)
Receipt of Government Grants		66,774,675	81,080,665
Interest received		1,225,301	928,861
Net cash provided by operating activities	4 (b)	22,614,278	39,987,292
CASH FLOWS USED IN INVESTING ACTIVITIES			
Proceeds from sale of property, plant and equipment		(8,788)	16,909
Purchase of property, plant and equipment		(28,351,706)	(27,334,922)
Net cash used in investing activities		(28,360,494)	(27,318,013)
Net increase/(decrease) in cash and cash equivalents		(5,746,216)	12,669,279
Cash and cash equivalents at beginning of year		42,619,169	29,949,890
Cash and cash equivalents at end of year	4 (a)	36,872,953	42,619,169

The statement of cash flows is to be read in conjunction with the notes to the financial statements.

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

1) Company Information
Indigenous Essential Services Pty Limited (the Company) is a proprietary company operating and domiciled in Australia. On 17 September 2010, Directors authorised the issue of the Company's financial report for the year ended 30 June 2010.

2) Statement of significant accounting policies
The significant accounting policies which have been adopted in the preparation of this report are:

(a) Statement of compliance
This general purpose financial report has been prepared in accordance with Accounting Standards and Interpretations and the *Corporations Act 2001*.

Accounting Standards include Australian equivalents to International Financial Reporting Standards (A-IFRS).

Adoption of new and revised Accounting Standards
In the current year, the Company has adopted all of the new and revised Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that are relevant to its operations and effective for the current annual reporting period. Details of the impact of the adoption of these new accounting standards are set out in the individual accounting policy notes set out below.

Standards and Interpretations effective for the first time in the current period
The following new and revised Standards and Interpretations have been adopted in the current period and have affected the amounts reported or the presentation/disclosure in these financial statements:

Standard or Interpretation	*Nature of Change to Accounting Policy*
AASB 101 ' Presentation of Financial Statements' (revised September 2007)	AASB 101 (September 2007) has introduced terminology changes (including revised titles for the financial statement statements) and changes in the format and content of the financial statements.
AASB 2007-8 'Amendments to Australian Accounting Standards arising from AASB 101'	
AASB 2007-10 Further Amendments to Australian Accounting Standards arising from AASB 101'	

The following new and revised Standards and Interpretations have also been adopted in these financial statements. Their adoption has not had any significant impact on the amounts reported in these financial statements as they do not result in any changes to the Company's existing accounting policies. However, they may affect the accounting for future transactions or arrangements:

Standard or Interpretation
AASB 2008-1 'Amendments to Australian Accounting Standard - Share-based Payments: Vesting Conditions and Cancellations'
AASB 2008-2 'Amendments to Australian Accounting Standards - Puttable Financial Instruments and Obligations Arising on Liquidation'
AASB 2008-5 'Amendments to Australian Accounting Standards arising from the Annual Improvements Process'
AASB 2008-6 'Further Amendments to Australian Accounting Standards arising from the Annual Improvements Process'
AASB 2008-7 'Amendments to Australian Accounting Standards - Cost of an Investment in a Subsidiary, Jointly Controlled Entity or Associate'
AASB 2008-8 'Amendments to Australian Accounting Standards - Eligible Hedged Items'
AASB 3 'Business Combinations' (revised)
AASB 123 'Borrowing Costs' (revised)
AASB 127 'Consolidated and Separate Financial Statements' (revised)
AASB 2008-3 'Amendments to Australian Accounting Standards arising from AASB 3 and AASB 127'
AASB Interpretation 15 'Agreements for the Construction of Real Estate'
AASB Interpretation 16 'Hedges of a Net Investment in a Foreign Operation'
AASB Interpretation 17 'Distributions of Non-cash Assets to Owners'
AASB Interpretation 18 'Transfers of Assets from Customers'
AASB 2008-13 'Amendments to Australian Accounting Standards arising from AASB Interpretation 17 - Distributions of Non-cash Assets to Owners'

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

Standards and Interpretations issued not yet effective

At the date of authorisation of the financial report, the following Standards and Interpretations were in issue but not yet effective. The consolidated entity does not intend to adopt any of these pronouncements before their effective dates. Initial application of these Standards and Interpretations will not affect the reported results or position of the consolidated entity as they do not result in any changes to the consolidated entity's accounting policies. Adoption will, however, result in changes to information currently disclosed in the financial statements.

Standard or Interpretation	*Effective annual reporting periods beginning on or after*	*Expected to be initially applied in the financial year ending*
AASB 2009-5 'Further Amendments to Australian Account Standards arising from the Annual Improvements Project'	1 January 2010	30 June 2011
AASB 2009-8 'Amendmants to Australian Accounting Standards - Group Cash-Settled Share-based Payment Transactions'	1 January 2010	30 June 2011
AASB 2009-10 'Amendments to Australian Accounting Standards - Classification of Rights Issues'	1 February 2010	30 June 2011
AASB 2009-12 'Amendments to Australian Accounting Standards'	1 January 2011	30 June 2012
AASB 124 'Related Party Disclosures (revised December 2009)'	1 January 2011	30 June 2012
AASB 9 'Financial Instruments'	1 January 2013	30 June 2014
AASB 2009-11 'Amendments to Australian Accounting Standards arising from AASB 9'	1 January 2013	30 June 2014
AASB 2009-14 'Amendments to Australian Interpretation - Prepayments of a Minimum Funding Requirement'	1 January 2011	30 June 2012
Interpretation 19 'Extinguishing Financial Liabilities with Equity Instruments'	1 July 2010	30 June 2011

(b) Basis of preparation

The financial report is prepared on an historical cost basis. Cost is based on the fair values of the consideration given in exchange for assets.

These accounting policies have been consistently applied by the Company and are consistent with those of the previous year.

The financial report is presented in Australian dollars.

(c) Use and revision of accounting estimates

The preparation of the financial report requires the making of estimations and assumptions that affect the recognised amounts of assets, liabilities, revenues and expenses and the disclosure of contingent liabilities. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis of making the judgments about carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

(d) Revenue recognition

Revenue is recognised to the extent that it is probable that the economic benefits will flow to the Company and the revenue can be reliably measured. The following specific recognition criteria must also be met before revenue is recognised:

Sale of goods

Revenue from the sale of goods is recognised (net of discounts and allowances) when the significant risks and rewards of ownership of the goods have passed to the buyer and the costs incurred or to be incurred in respect of the transaction can be measured reliably. Risks and rewards of ownership are considered passed to the buyer at the time of delivery of goods to the customer. Sale of goods includes estimates for unbilled consumption of electricity and water as at reporting date.

Rendering of services

Revenue from the rendering of services is recognised when the service is provided, having regard for the costs incurred in providing those services.

Government grants

Revenue in the form of government grants is received from the Northern Territory Government. Government grants are assistance by the government in the form of transfers of resources to the Company in return for past or future compliance with certain conditions relating to the operating activities of the Company.

Government grants are not recognised until there is reasonable assurance that the Company will comply with the conditions attaching to them and the grants will be received.

Where the grant relates to an expense or capital item, it is recognised initially as deferred income in the statement of financial position and recognised as income over the periods necessary to match the grant on a systematic basis to the costs that it is intended to compensate.

Interest Revenue

Interest revenue is recognised as it accrues.

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

(e) Goods and services tax

Revenues, expenses and assets are recognised net of the amount of goods and services tax (GST), except where the amount of the GST incurred is not recoverable from the taxation authority. In these circumstances, the GST is recognised as part of the cost of acquisition of the asset or as part of the expense.

Receivables and payables are stated with the amount of GST included. The net amount of GST recoverable from, or payable to, the taxation authority (through Power and Water) is included as a current asset or liability in the statement of financial position.

Cash flows are included in the statement of cash flows on a gross basis. The GST components of cash flows arising from investing and financing activities which are recoverable from, or payable to, the taxation authority (through Power and Water) are classified as operating cash flows.

(f) Income tax consolidation

The Power and Water Corporation is the head entity in a tax-consolidated group comprising all of its wholly-owned subsidiaries apart from Indigenous Essential Services Pty Limited. Indigenous Essential Services Pty Limited was removed from the National Tax Equivalent Regime effective 1 July 2003.

(g) Cash and cash equivalents

Cash assets include cash on hand and at bank.

(h) Trade and other receivables

Trade and other receivables are recognised and carried at the original invoice amount less an allowance for any uncollectible amounts.
Trade receivables are on 14 day terms and other receivables are on 30 day terms.

(i) Inventories

Inventories are carried at the lower of cost and net realisable value. Costs are assigned to inventory based on the weighted-average purchase cost of bringing each item to its present location and condition.

(j) Property, plant and equipment

Acquisition of assets

The carrying value of assets are originally stated at cost less accumulated depreciation and any accumulated impairment losses. Such cost includes the cost of replacing parts that are eligible for capitalisation when the cost of replacing the parts is incurred.

Where an asset is acquired at no cost, or for nominal cost, the cost is its fair value as at the date of acquisition.

Property, plant and equipment assets are measured at deemed cost being the fair value of assets at the transition date to AIFRS on 1 July 2004, less accumulated depreciation and less any impairment losses recognised at that date.

Depreciation and amortisation

Complex assets

The components of major assets that have materially different useful lives, are effectively accounted for as separate assets, and are separately depreciated.

Useful lives

All assets, excluding freehold land, have limited useful lives and are depreciated using the straight-line method over their estimated useful lives.

Assets are depreciated from the date of acquisition.

Depreciation rates and methods are reviewed annually for appropriateness. When changes are made, adjustments are reflected prospectively in current and future periods only. Depreciation is expensed.

The depreciation useful lives used for each class of asset are as follows:

Building, plant and equipment	June 2010	June 2009
Building and improvements	3 to 93 years	3 to 93 years
Plant and equipment	1 to 100 years	1 to 100 years

Impairment of assets

The carrying values of plant and equipment are reviewed for impairment at each reporting date, with recoverable amounts being estimated when events or changes in circumstances indicate that the carrying value may be impaired.

The recoverable amount of plant and equipment is the depreciated replacement cost.

Depreciated replacement cost is defined as the current replacement cost of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

An impairment exists when the carrying value of an asset exceeds its estimated recoverable amount. The asset is then written down to its recoverable amount.

For property, plant and equipment, impairment losses are recognised in the statement of comprehensive income.

Derecognition and disposal
An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the statement of comprehensive income in the year in which the asset is derecognised.

(k) Payables
Trade payables and other payables are carried at amortised cost and represent liabilities for goods and services provided to the Company prior to the end of the financial year that are unpaid and arise when the Company becomes obligated to make future payments in respect of the purchase of these goods and services. Trade accounts payable are normally settled within 30 days.

Notes to the Financial Statements

Indigenous Essential Services Pty Limited for the year ended 30 June 2010

		2010 $	2009 $
3	**Revenue and expenses**		
	Revenue and expenses from continuing operations		
(a)	**Sale of goods**		
	Electricity	20,838,288	17,280,902
	Water	1,686,148	1,060,471
		22,524,436	18,341,373
(b)	**Rendering of services**		
	Recurrent grant	44,965,978	50,505,512
	Capital grant	23,819,617	20,625,663
	Sewerage services	740,100	857,159
		69,525,695	71,988,334
(c)	**Other income**		
	Community Service Obligations	5,006	-
	Gifted assets	401,541	4,996,655
	Capital contributions and recoverable works	4,597,846	6,709,259
	Net profit on disposal of property, plant and equipment	(8,788)	16,909
		4,995,605	11,722,823
(d)	**Other expenses**		
	Repairs and maintenance	10,778,128	10,012,994
	Direct personnel costs	10,274,202	8,437,589
	Agents - Community Contract Fees	6,776,312	6,340,233
	Other	13,098,319	12,583,895
		40,926,961	37,374,711

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

		2010 $	2009 $
4	**Cash and cash equivalents**		
(a)	**Reconciliation of cash**		
	Cash at the end of the financial year as shown in the Cash at bank	36,872,953	42,619,169
	The weighted average interest rate on cash assets at 2010 is 3.46% (2009 : 4.75%)		
(b)	**Reconciliation of net profit to net cash flows from operations**		
	Net Profit	11,846,920	10,352,298
	Adjustments for:		
	Depreciation	17,898,632	19,572,159
	Contributed assets provided free of charge	401,541	4,996,655
	Net profit on disposal of property, plant and equipment	(8,788)	16,909
	Changes in assets and liabilities		
	(Increase)/decrease in inventories	(855,451)	2,267,430
	(Increase)/decrease in trade and other receivables	(538,233)	1,087,674
	(Increase)/decrease in prepayments	4,355	-
	(Decrease)/increase in trade and other payables	(5,349,192)	11,721,295
	Net cash flows from operating activities	22,614,278	39,987,292
5	**Trade and other receivables**		
	Current		
	Interest receivable	125,346	48,930
	Other debtors	831,555	369,738
		956,901	418,668
	Receivables at 30 June 2010 are non-interest bearing.		
6	**Inventories**		
	Materials and stores	1,711	139,690
	Distillate stocks	4,718,122	3,724,692
	Tokens	-	-
		4,719,833	3,864,382

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

7 Property, plant and equipment

June 2010	Land $	Buildings $	Plant and Equipment $	Work in Progress $	Total Property, Plant and Equipment $
Cost					
Opening Balance	21,332	36,053,175	282,705,250	26,964,138	345,743,895
Transfer / Restructure	-	31,922	89,044	(122,179)	(1,213)
Additions	-	-	401,541	29,083,570	29,485,111
Transfer From WIP	-	4,483,844	34,195,105	(38,678,949)	-
Disposals	-	-	(465,398)	-	(465,398)
Closing Balance	**21,332**	**40,568,941**	**316,925,542**	**17,246,580**	**374,762,395**
Accumulated Depreciation					
Opening Balance	-	(20,484,704)	(150,192,346)	-	(170,677,050)
Transfer / Restructure	-	(14,737)	15,947	-	1,210
Depreciation	-	(1,884,801)	(16,013,831)	-	(17,898,632)
Disposals	-	-	398,512	-	398,512
Rounding	-	-	1	-	1
Closing Balance	**-**	**(22,384,242)**	**(165,791,717)**	**-**	**(188,175,959)**
Written Down Value					
Opening Balance	21,332	15,568,471	132,512,904	26,964,138	175,066,845
Transfer / Restructure	-	17,185	104,991	(122,179)	(3)
Additions	-	-	401,541	29,083,570	29,485,111
Depreciation	-	(1,884,801)	(16,013,831)	-	(17,898,632)
Transfer From WIP	-	4,483,844	34,195,105	(38,678,949)	-
Disposals	-	-	(66,886)	-	(66,886)
Rounding	-	-	1	-	1
Closing Balance	**21,332**	**18,184,699**	**151,133,825**	**17,246,580**	**186,586,436**

June 2009	Land $	Buildings $	Plant and Equipment $	Work in Progress $	Total Property, Plant and Equipment $
Cost					
Opening Balance	21,332	22,747,226	278,489,308	12,154,461	313,412,327
Transfer / Restructure	-	12,162,904	(12,168,431)	-	(5,527)
Additions	-	401,886	4,594,773	27,340,436	32,337,095
Transfer From WIP	-	741,159	11,789,600	(12,530,759)	-
Closing Balance	**21,332**	**36,053,175**	**282,705,250**	**26,964,138**	**345,743,895**
Accumulated Depreciation					
Opening Balance	-	(7,065,574)	(144,039,329)	-	(151,104,903)
Transfer / Restructure	-	(10,976,417)	10,976,429	-	12
Depreciation	-	(2,442,713)	(17,129,446)	-	(19,572,159)
Closing Balance	**-**	**(20,484,704)**	**(150,192,346)**	**-**	**(170,677,050)**
Written Down Value					
Opening Balance	21,332	15,681,652	134,449,979	12,154,461	162,307,424
Transfer / Restructure	-	1,186,487	(1,192,002)	-	(5,515)
Additions	-	401,886	4,594,773	27,340,436	32,337,095
Depreciation	-	(2,442,713)	(17,129,446)	-	(19,572,159)
Transfer From WIP	-	741,159	11,789,600	(12,530,759)	-
Rounding	-	-	-	(2)	(2)
Closing Balance	**21,332**	**15,568,471**	**132,512,904**	**26,964,136**	**175,066,843**

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

		2010 $	2009 $
8	**Trade and other payables**		
	Payable to controlling entity	7,421,483	7,743,976
	Other creditors and accruals	9,520,001	9,982,135
	Unearned revenue	21,526,535	25,426,123
		38,468,019	43,152,234

Trade and other payables are non-interest-bearing. The policy of the Company is to settle trade payables within 30 days. The Company has financial risk management policies in place to ensure that all payables are paid within the credit timeframe.

9	**Contributed equity**		
	Issued and paid-up share capital		
	10 (2009:10) ordinary shares of $1 fully paid	10	10
		10	10

Fully paid ordinary shares carry one vote per share and carry the right to dividends. The shares have no par value.

10	**Retained earnings**		
	Retained earnings at beginning of year	178,821,174	168,468,876
	Net profit for the year	11,846,920	10,352,298
	Retained earnings at end of the year	190,668,094	178,821,174

11	**Commitments**		
	Capital expenditure commitments		
	Contracted but not provided for and payable: within one year	15,053,096	5,715,974

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

12 Financial instruments

(a) Financial risk management objectives and policies

The Company has various financial instruments such as trade receivables and trade payables. It is, and has been throughout the period under review, the Company's policy that no trading in financial instruments shall be undertaken. The main risks arising from the Company's financial instruments are liquidity risk and credit risk. The Board of Directors reviews and agrees policies for managing each of these risks and they are summarised below.

The Company's overall strategy remains unchanged from 2009.

(b) Market Risk

The Company provides electricity, water and sewerage services to remote Indigenous communities in the Northern Territory.

The Company receives grant funding from the Northern Territory Government to construct and maintain assets required to provide electricity, water and sewerage services to remote Indigenous communities in the Northern Territory. The Company is the only provider of these services to remote Indigenous communities in the Northern Territory.

The service contract between the Company and the Northern Territory Government expired on 30 June 2010. The contract has been extended for a period of three years from 2010-2011 to 2012-2013.

The following table sets out the source of the Company's income.

	2010		2009	
Source of Income	**$**	**%**	**$**	**%**
Grant funding	68,785,595	70%	71,131,175	69%
Electricity	20,838,288	21%	17,280,902	17%
Water	1,686,148	2%	1,060,471	1%
Sewerage	740,100	1%	857,159	1%
Gifted Assets	401,541	1%	4,996,655	4%
Capital contributions and recoverable works	4,597,846	4%	6,709,259	7%
Other	1,297,935	1%	878,386	1%
Total Revenue	**98,347,453**	**100%**	**102,914,007**	**100%**

(c) Credit risk management

Credit risk represents the loss that would be recognised if counterparties failed to perform as contracted. The credit risk on receivables of the Company that has been recognised in the balance sheet is the carrying amount net of any provision for doubtful debts.

The Company performs works on behalf of Northern Territory Government agencies and private companies on a recoverable works basis. Funding for general recoverable works is obtained upfront thereby reducing credit risk associated with these transactions.

(d) Liquidity risk management

The Company's objective is to provide continued and reliable services to remote Indigenous communities in the Northern Territory within the grant funding and sales revenue it receives. Each year the Company limits expenditure to the level of grant funding and sales revenue it receives for that year.

(e) Commodity price risk

The Company is exposed to changes in the price of distillate which is used to power electricity generators. Each year grant funding received from the Northern Territory Government is based on an operational budget that includes an estimated cost of distillate consumption. In the event the distillate price varies upwards and the Company does not have sufficient grant funds to continue operating, the Company can apply to the Northern Territory Government for additional grant funds.

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

13 Related party information

The following table provides the total amount of transactions that were entered into with related parties for the relevant financial year (for information regarding outstanding balances at year-end refer to note 8).

		Sales to related parties $	Purchases from Related parties $	Amounts owed by related parties $	Amounts owed to related parties $
Related party					
Power and Water	2010	0	16,163,749	0	7,421,483
Corporation	2009	0	14,495,292	0	7,743,976
Northern Territory	2010	73,376,441	633,428	445,511	21,435,292
Government	2009	77,826,345	495,056	410,668	24,778,245

(i) The controlling entity of the Company is Power and Water Corporation, a government owned corporation pursuant to the *Government Owned Corporations Act 2001*. Power and Water Corporation is wholly owned by the Northern Territory.

(ii) The Company purchases electricity, water and sewerage services from Power and Water Corporation's infrastructure for remote Indigenous communities that are able to be connected to this infrastructure rather than requiring stand alone infrastructure. In addition, the Company purchases labour, accounting, computing, human resources, secretarial services and utility services for its operations from Power and Water Corporation.

(iii) The Company receives operational and capital grants from the Northern Territory Government enabling it to provide electricity, water and sewerage services to remote Indigenous communities. The Company also receives recoverable works funds for specific projects undertaken on behalf of the Northern Territory Government.

14 Economic dependency

The Company's revenue is derived from two main sources as follows:

	2010 %	2009 %
Revenue derived from the Northern Territory Government	75%	80%
Revenue from provision of utility services	25%	20%
	100%	100%

Notes to the Financial Statements
Indigenous Essential Services Pty Limited for the year ended 30 June 2010

15 Auditor's remuneration

	2010 $	2009 $
Audit Services:		
Auditors of the Company - NT Auditor-General	23,827	38,684

16 Director and executive disclosures

Directors

The names of each person holding the position of director within Indigenous Essential Services Pty Limited during the financial year are listed in the Directors' report.

Directors do not receive any compensation for their directorship. No director has entered into a material contract with the Company since the end of the previous financial year and there were no material contracts involving directors' interest subsisting at year-end.

Compensation of key management personnel

Indigenous Essential Services Pty Ltd has no employees.

17 Events after the reporting period

There has not arisen in the interval between the end of the financial year and the date of this report any item, transactions or event of a material or unusual nature likely, in the opinion of the directors of the Company, to affect significantly the operations of the Company, the results of those operations, or the state of affairs of the Company in future financial years.

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