



## Water and Sanitation Program

An international partnership to help the poor gain sustained access to improved water supply and sanitation services

# Durban Metro Water

## Private Sector Partnerships to Serve the Poor



### WSP-Africa

This paper is part of a research and dissemination initiative which the Water and Sanitation Program is carrying out into private sector participation and the poor in the urban water sector. Proposals to involve the private sector in water supply and sanitation sometimes raise fears that the poor will be priced out through higher tariffs and costly connection fees or overlooked because they live in hard-to-reach locations. The reality is that the private sector has the capacity and the interest to serve the poor, is willing to experiment with low-cost options and different levels of service, and with greater efficiency, can benefit all consumers. There are examples of this in many parts of the world. This series will document best practices and show how service to the poor can be addressed by the skillful design of private sector contracts; by strengthening the regulatory system and making sure it protects the interests of the poor; and by creating partnerships between civil society, local authorities and private operators.

The series also analyzes lessons learnt and explores how international experiences can be adapted to various regions.




### Summary

This case study outlines Durban Metro Water's carefully structured partnerships with the private sector firms Lyonnaise des Eaux and Vivendi, which have been undertaken in an overall attempt to improve service delivery to low income communities. The note concludes with recommendations from the Executive Director of Durban Metro Water on how utilities can use private sector partnerships to experiment and innovate with respect to service to the poor.

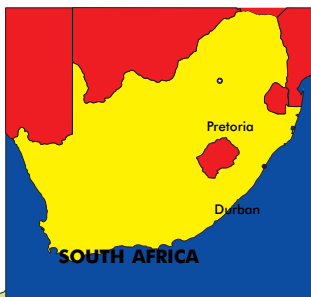


# Description of Durban

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 Durban, located on the eastern coast of South Africa, is South Africa's second-largest industrial hub and one of the country's fastest-growing urban centers. The Durban Metro Area (DMA) covers 1,370 km<sup>2</sup>, and stretches 72 km along the Indian Ocean and 52 km inland. The population is approximately three million.


Much of the current Durban Metro Area is made up of areas that were previously black townships with separate administrative bodies under the old apartheid system. These areas have poor infrastructure and many have traditionally had inadequate water supply and sanitation service provision. They have now been incorporated into the city jurisdiction, and added to urban areas that have extremely high standards of living and full conventional reticulated



water supply and sewerage systems. Addressing the resulting imbalances in the provision of water and sanitation services and quickly reaching the large number of unserved, poor households are major challenges for the city.

## The Poor in Durban

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 Poverty is a serious problem in Durban, despite the fact that it is the stated aim of Durban to be a thriving world class industrial and commercial center by 2015, and that many parts of Durban are similar to affluent cities in highly developed countries. The Durban Metropolitan Profile of November 1999 reported that 41 percent of the economically active population of the DMA was not in formal employment, and that 43 percent of households have incomes of less than \$200 per month.

The gap between rich and poor is most evident when it comes to the issue of housing. The national government has initiated a 'Peoples Housing Process' (PHP) for low-income households to develop and build their own houses, which includes subsidies designed to assist people to build a house on a serviced site (one

with water supply, sewage disposal, road access, etc). Durban Metro is supporting the PHP through a program of housing initiatives. However, the Government's Provincial Housing Board (PHB) subsidies are insufficient for the provision of conventional housing and services infrastructure, and thus Durban Metro has a strong incentive to find low-cost ways to provide water supply and sanitation services to new housing areas.

## Water Supply Services to the Poor

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 Durban Metro Water Services (DMWS), the department of Durban Metro which deals with water supply, sanitation and solid waste, currently serves 360,000 metered water connections. However, it is estimated that 155,000 households (500,000 people) in the city lack household connections. These people are relying on standposts, many of which were inherited by DMWS from the previous provincial administration, or are not served by piped water at all, and use surface water such as streams. There are also an estimated 10,000 to



## BOX 1: SEMI-PRESSURE SYSTEM WITH GROUND TANKS

Water is reticulated using small diameter (less than 50 mm) plastic piping (polypropylene, HDPE or high impact uPVC), which is laid at shallow depths along the roads or tracks in the area to be served, 'snaking' where necessary to avoid obstructions. At suitable intervals a metered manifold box is installed, from which 20 households can be connected. The household itself pays for a feeder pipe, usually 12 mm, from the manifold to a 200-liter tank, and digs the trench from the manifold to the dwelling. The pipe work is supplied, laid and connected by DMWS. The tanks are either installed on the ground on plinths made of concrete-filled used car tyres, or on metal stands, and can be installed either inside or outside the home, according to the householder's preference. Many householders plumb the tank to supply water to fixtures within the house. Originally, a water bailiff, a local resident employed by Durban Metro Water, turned on supply to the tanks for a short period of time each day, just long enough to allow them to fill, but now this is done electronically. Each tank is provided with a float valve to stop it from overflowing when it is being filled, and an outlet valve to prevent it from being emptied while it is being filled. Each household is thus provided with 200 liters per day, in line with current South African water policy, which dictates that every household must be provided with 6 m<sup>3</sup> of water every month. Durban Metro Water has made the decision not to bill households for this level of supply, so the 6 m<sup>3</sup> is free (provision of this amount of free water has since become national policy).



A semi-pressure system with a ground tank.



A metered manifold box.

20,000 illegal connections to the piped system.

Durban Metro Water has already shown itself to be pro-active and innovative in developing approaches to serving the poor. While it is beyond the scope of this paper to undertake a full description or analysis of Durban's services to the poor, it is interesting to note that the department has developed a variety of different water supply service levels in order to bring affordable water supply to the large number of poor households and to make as many residents of the service area as possible customers of the utility. These options are:

- conventional full-pressure system
- semi-pressure system with ground tanks (see Box 1)
- semi-pressure roof tank system (see Box 2) and
- standposts

Both the low pressure systems (roof tanks and ground tanks) can be installed at a lower installation cost than conventional systems, as they use small diameter, low pressure pipework, inexpensive valves and fittings, and manual labor. The labor-intensive nature of the installation and operation also provides local employment.

Water bailiffs (who previously operated the ground tank systems) also operate standposts at which they sell water by the liter to residents that do not have a ground tank or roof tank, thus ensuring that everyone has access to some form of water supply. In some areas, automated standposts at which the user inserts a pre-paid card have been installed. However, standposts are not the preferred mechanism for supplying the

## BOX 2: SEMI-PRESSURE SYSTEM WITH ROOF TANKS

Water mains are laid conventionally in the road reserve. Domestic water tanks are installed at roof level in each house, and supply from these tanks is plumbed to fixtures in the home. As the tanks take the peak load off the reticulation system, the mains can be sized one size smaller than full pressure mains (for instance, 75 mm instead of 100 mm). Low-pressure supply to the tank is continuous throughout the day, and each household is metered. The first 6 m<sup>3</sup> of water consumed per month is not billed for, but all consumption after that is. Daily consumption at each dwelling is in the order of 700 liters.



poor, as this method does not allow for the delivery of the 6 m<sup>3</sup> of free water that Durban allocates to other users.

## Experience with Private Sector Participation

Like many water utilities, Durban Metro Water has a great deal of experience with contracting to the private sector, as DMWS routinely uses the local private sector for construction projects. In addition, in 1998, DMWS designed and negotiated a 20-year BOOT contract for a water recycling plant with Durban Water Recycling, which is a purpose-built company whose principle shareholder is a subsidiary of Vivendi Water. DMWS Durban Metro Water recognized the fact that the large international water companies had enormous expertise which was not available in-country, and that they could be an important resource as Durban tried to tackle the water supply and sanitation challenges it faced. However, entering into a conventional contract (such as a concession or lease) with one of these companies was not a politically viable option, due to two main reasons: first, that the city is currently restructuring to a Unicity from a Metro, and there was reluctance to pre-empt the Unicity Council's decisions, and second, there would have been labour opposition to such a move. (There has been strenuous labor opposition to concessions in other cities in South Africa, leading to long delays.) Durban therefore decided to explore ways to partner with the international private sector outside of the conventional delegated management arrangements.

Armed with the confidence and

understanding of the private sector that the successful contract for the water recycling plant instilled, Durban has now entered into two project agreements with private sector firms in order to carry out research into and development of arrangements to provide water and sanitation services to the poor. The fact that Durban Metro Water fosters an environment of innovation has helped make this possible, but in addition the utility has a clear idea of what it wants, what the private sector can offer, what the pitfalls are, and what the benefits of partnership can be. While private sector firms were interested in partnering with Durban for a variety of reasons, one of which was to nurture possible business relationships for the future, Durban Metro Water management were clear that there should be no residual obligation on the part of the utility to any of its private sector partners, that learning would be shared, and that information generated would be in the public domain.

## Partnership with Vivendi Water: Tri-Sector Approach

In March 1999, Durban Metro entered into an agreement with several partners to carry out a project to provide improved services to previously underprivileged communities in the Durban and Pietermaritzburg area. The partners included public sector, private sector and NGOs, including:

- ◆ Umgeni Water, the regional water board and bulk water supplier
- ◆ the Mvula Trust, an NGO
- ◆ the South African Water Research Commission, and
- ◆ Vivendi Water, a private sector water company

The project is part of the global Business Partners for Development (BPD) program, which aims to demonstrate the role that tri-sector partnerships, bringing together the private sector, NGOs and government, can have in addressing development problems.

Durban's involvement in this project came about after Vivendi Water contacted Umgeni Water (the bulk water supplier in the province of KwaZulu-Natal) and Mvula Trust to propose a BPD project to the Pietermaritzburg-Transitional Local Council. The Local Council agreed, and soon after the Executive Director of DMWS contacted Vivendi Water to suggest that a similar project be developed in Durban. The two projects together are now known as the 'KwaZulu-Natal Project'.

The objective of the project is "to demonstrate how a partnership of NGO, public and private sectors can address the issues of providing adequate and sustainable water and sanitation services to poor sections of the population".

The project has identified pilot zones, in which pilot schemes were set up.

The interventions being piloted include the introduction of the three service levels described earlier in this note, community service centers, and improved customer management (including tariff policy, billing systems and cost recovery procedures). Community liaison is a very important part



An automated standpost in which a user inserts a pre-paid card.

of the project, and includes consultation, using existing community structures, workshops to educate people about the project, and capacity-building within the communities and the local government agencies.

Each of the partners is involved in different components of the project, and some provide funding, which others do not. The Mvula Trust is involved in community liaison work, and Durban Metro Water is the service provider. Vivendi's particular contribution to the project has been project management, provided by senior staff of the company who have experience in water system operation in other parts of the world. Vivendi has also provided links to their global network of expertise, specifically in the use of GIS systems, and in innovative sewage treatment.

The total project budget is R15.4 million (US\$2.6 million), of which Vivendi Water has committed R4.5 mil-

lion (\$750,000, half of which is for the Durban component, and half for the Pietermaritzburg component), and DMWS R3.2 million (US\$530,000).

The major components of Vivendi's involvement include:

- ◆ provision of a part-time project director
- ◆ provision of a full-time project manager, based in Durban, to manage the BPD project as a whole
- ◆ support to the water loss program
- ◆ support to establishing a Geographic Information System (GIS) in order to improve customer management (creating a facilities map, carrying out incident mapping, setting up a customer billing database, analyzing water demand, etc)
- ◆ supporting research into anaerobic baffled reactors for decentralized sewage treatment

At the end of 2000, the project partners reported that a real and dynamic partnership was in place. Education and awareness programs were under way, including school health and hygiene awareness, and the use of innovative approaches for community sanitation awareness-building. A water loss management study was under way in the Ntuzuma area of Durban, and a GIS project had begun. An experimental anaerobic baffled reactor had been built and set up at the Umbilo Wastewater Treatment works, and initial trials showed promising results. Plans were being made to test a reactor in a community.

The project includes a research and dissemination component that will ensure that the information and learning generated will be accessible to all. The Water Research Commission (WRC), which has committed

R880,000 (US\$150,000), finances this component of the project.

## Partnership with Lyonnaise des Eaux: Research into Condominial Sewerage

In July 1999, Durban Metro Water signed a memorandum of understanding with Water and Sanitation Services South Africa (WSSA), a joint venture subsidiary of Lyonnaise des Eaux, and Group 5, a major South African construction company specializing in water-related infrastructure, to carry out a joint research project with the Water Research Commission to test the applicability of condominial sewerage, which is referred to as 'Waterborne Shallow Sewer System' (WSSS), in South Africa, in poor areas of the city.

Lyonnaise des Eaux had experience with condominial sewerage from the project in El Alto in Bolivia, and was interested in exploring whether the system could be replicated in other countries. Durban Metro Water felt it was important to find a low-cost sanitation technology that complemented the affordable water delivery service provided by the semi-pressure system. WRC had conducted a preliminary study of the applicability of shallow sewerage systems in South Africa, which had found that the technology held promise in high-density urban and peri-urban areas.

The objectives of the project are to:

- ♦ research the legal viability of WSSS
- ♦ determine whether the administrative burden on the local authority is lower with WSSS than with conventional systems
- ♦ determine whether the costs of WSSS are within the Provincial Housing Board (PHB) subsidy guidelines
- ♦ assess the community's satisfaction with the system

In the pilot project, there are three costs associated with the condominial systems:

1. The pipe linking the household to the community-managed portion of the pipe network: this is paid for and laid by the individual household.
2. The cost of the community-managed network: this is paid by the condominial out of the pooled PHB subsidy of R15,000 for each housing unit. The network has been laid by local laborers to save on costs.
3. The cost of the DMWS collector sewers: this is borne by DMWS, which charges the condominial a connection fee of R122 to cover the inspection costs. However, this is then divided by the number of households connected, which on an average is 15, so each household actually pays R8 (just over US\$1.00) for their connection.

Two areas were selected for the research pilot project: Briardale and Emmaus. Both are areas with predominantly black residents where new housing is being constructed. In some of the project area there is subsurface rock, so a system such as condominial sewerage which requires much shallower excavation had major advantages.

Before the project started, Lyonnaise des Eaux arranged for five people associated with the project to

visit El Alto at their expense, including an engineer from Durban Metro Wastewater Management.

Lyonnaise provided a full-time project manager, who lived in Durban for a year and worked from the Durban Metro Water offices. The project manager's job was to manage, supervise and monitor the implementation of all aspects of the project (technical, financial, etc). Lyonnaise provided social consultants to build

### BOX 3: CONDOMINIAL SEWERAGE SYSTEMS

In a conventional sewerage system, every household is an individual user with a connection to the sewers located in every street. In a condominial sewer system, the community (the 'condominial') maintains an intermediate network that links their houses to the main trunk sewer system through one communal connection. Instead of being laid under roads, using conventional trenching and pipe materials, the network is laid through people's properties, or on footpaths between them. The systems use smaller pipe diameters, and, as the pipes are laid where there is no vehicular traffic, shallow depths and thinner pipes can be used. The community is responsible for the maintenance of the intermediate network, which is easily accessed. Each household also pays for the length of a small diameter pipe connecting their house to the condominial network.



community capacity and mentor the community. Lyonnaise's total funding to the project, including these staff, is R2M (US\$260,000). Additional funding of R600,000 (US\$100,000) has been committed by WRC for a research component, and is being used in part to appoint a consultant as a research manager. DMWS is paying the rest of the costs of the project, including extension to the trunk mains, and the provision of DMWS's own design and management staff.

The systems in both areas have been designed and construction has started. A few houses in Briardale are already fully operational, and another 40 houses are awaiting the installation of bathrooms. By contrast, in Emmaus, a few houses are also fully connected, but the rest of the households have been confused by recent election promises that water will be free for all, which they have taken to mean that connection charges should be waived. This has created a deadlock that will require political intervention.

Initial calculations suggest cost savings of 54 percent in Briardale and 59 percent in Emmaus, but these figures are preliminary. The amount of cost savings are dependent on

how the project accounting is done, and what costs are included. It will take some time before accurate costs are available.

An interesting aspect of the project is the issue of legal viability of WSSS. The project participants knew before they started that essentially they would be transgressing the law on various fronts. For instance, the National Building Regulations concerned with sanitaryware and systems do not contemplate shallow sewers and the regulations are more stringent than the standards applied on shallow sewers. A legal obstacle also emerged in the fact that the two project areas differ in terms of land ownership arrangements. In Briardale, the land is owned in a manner allowed by the Communal Property Association Act, which means it is essentially communally owned, but in Emmaus, the plots are freehold. Condominial sewerage requires that the pipe network be laid through people's land, which means the owners have to agree. However, under South African law, the obligation to allow the presence of the pipes cannot be transferred when freehold land is sold, so there is always a risk that the new owner will

not agree to be part of the condominium, and will remove the pipes from his or her land. However, the Council decided in this case to take the risk of this happening, and went ahead with the pilot in Emmaus.

Essentially, the current legal system does not anticipate shallow sewers, and DMWS and its partners have had to accept the risks associated with the current projects. At the moment, this is feasible because the numbers are small, but obviously things must change if shallow sewers are to be adopted on a large scale. There is, however, a window of opportunity in the Water Services Act for providing alternative technology, which DMWS is hoping to exploit.

## Conclusions

Neil MacLeod, the Executive Director of Durban Metro Water Services, feels that the two partnerships described in this case study are helping to prepare the utility, the Council, labor and other stakeholders for the future; a future in which there will be much more involvement of the private sector. Through these partnerships, the local government is learning how the private sector works and thinks, and how to structure a contract and act as a regulator. The private sector firms are learning about poverty in South African cities, and are also learning to relate to and respect the local government. Vivendi Water reports that they are already applying the learning from Durban to their projects in Chad and Gabon.

Water companies undertake projects such as these for a variety of reasons, not all of which have to



Condominial Sewerage Systems:  
Community members build and maintain a network using small pipe diameters.



Users around an automated standpost.

do with adding to their expertise and thus maintaining a commercial advantage. A sense of global 'citizenship' is also a factor, as is pressure from shareholders and employees to be pro-active on poverty issues. Public opinion is very important to large water companies.

Increasing their expertise and their credibility are also important incentives for private sector firms. Water company officials report that few projects give them an opportunity to focus on poverty issues, but pilots like this do. They can thus be more credible and more confident when proposing innovative solutions for the poor on other projects, which they are often given the opportunity to do through pre-bid conferences, bid preparation procedures, and contract negotiations.

The type of innovative arrangements and technologies that Durban is experimenting with has wide-reaching policy implications. Governments who want to empower councils and

bureaucrats to use these non-conventional methods must be willing to create policy that makes them acceptable, and to encourage their use.

Transparency is obviously an important issue; it will not serve the interests of municipalities if partnerships such as this result in a one-sided distribution of information and knowledge, so that private companies gain insight into municipal service delivery issues but the municipality does not increase its own capacity. This is especially important if future commercial relationships are envisaged and competitive bidding may be used to award contracts.

Neil MacLeod's advice to other utilities planning similar initiatives is:

- ♦ run something small
- ♦ work in a suburb or small community
- ♦ learn together: learn how the private sector thinks, understand their problems with financing/risk, get them to understand poor communities and the local government
- ♦ use the arrangement to turn a powerful adversary into a partner
- ♦ involve those who might otherwise be opposed, for instance, labor unions, by having them sit on the steering committee
- ♦ be very aware of the outcomes, and structure the arrangement so at the end of the partnership everyone walks away with no residual dependency or obligation.

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