

# Chief Financial Officer's Review



Ms Matshidiso Nyembe

*The building of partnerships and collaborations with all relevant Stakeholders, especially in the technical fields, is a feature that defines the spirit and intent of the Rand Water Academy.*

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*Dear Rand Water Stakeholder,*

Rand Water's financial results for the year to 30 June 2015 underscore the Group's efforts to produce the returns that will facilitate further delivery of our development mandate. By reinvesting earnings in essential water infrastructure, we are extending water supply and sanitation services to many millions more South Africans in the years ahead, in line with the directives of our Shareholder.

The table on page 206 shows that Rand Water's record against key financial performance indicators continued to be good.

An increase in revenue and greater efficiencies helped lift net income by 22% to R1.4 billion. Total revenue on continuing operations increased by 13% to more than R9.8 billion. This was driven by a 2% increase in the volume of water sold, an 8.1% increase in the bulk water tariff and additional revenue from Bushbuckridge of 2.9%. These tariffs, as determined by the government, constitute our charge to customers mainly municipalities and some mines and industries. Approximately 90% of the Group's revenue comes from six municipalities.

We continued our work to cultivate new revenue streams as well as take on the responsibility of so-called 'implementing agency' projects. This led to a slight increase in other operating incoming to R738.9 million. Implementing agency services are those projects we carry out on behalf of municipalities and government departments and include, for example, operating wastewater treatment works and establishing and operating reticulation systems. The scale of this work has expanded significantly in recent years.

Group operating expenses increased by 1% to R959 million. The large increase was related in part to the inclusion of costs related to Bushbuckridge in the year (R71 million) and Secondary Activities as per Note 9 of the annual financial statements.

### KEEPING COSTS IN CHECK

It is Rand Water's policy to recover all its operational costs in the tariffs that are set by the government. In the year, we worked to limit input cost increases, recording a cost increase of 11.6%. The price of raw water is determined by a government pricing strategy which links it to producer price inflation. In 2015, Rand Water's total cost of raw water increased by 8.2%, a result of both volume growth and the price increase.

Rand Water's second largest input cost is that of energy. This is required to pump water to our customers and run our treatment plants. In the year, by securing various efficiencies we limited energy cost increases to 13%.

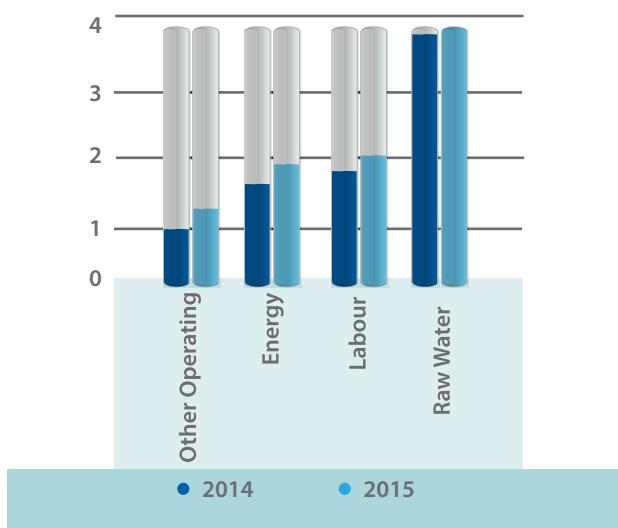
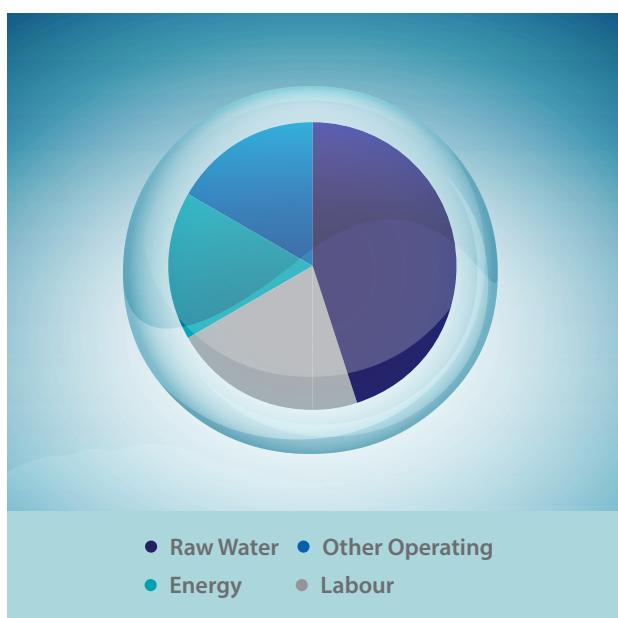
We await the decision of the Minister of Water Affairs and Sanitation on our plan to invest in a hydropower project to minimise the cost of energy and enhance the security of supply to our pumping stations. Ahead of this, we are carrying out a small pilot project, looking at the alternatives available to help reduce our reliance on Eskom and municipalities for energy.

In a challenging labour environment, labour costs rose with 11.6%. This was made up of salary increases of 8.7% and an incentive bonus increase of 1.5%, partially offset by savings resulting from a 1.5% decline in employee numbers due to a moratorium on filling vacancies. By including employees in

Bushbuckridge, total labour cost increased by 2.9%. Included in salary costs is the provision for the post-retirement liability, which reduced in 2015. The effect of this on the total labour cost was a saving of 2.2%.

Chemical costs, which had increased by 45% in 2014 after an anomaly in 2013, rose 15.5% in the 12 months to the end of June 2015, mainly driven by price increases as a result of the weakening of the rand.

### Operating Expense



In line with higher levels of capital expenditure in the year, detailed below, depreciation rose 14%.

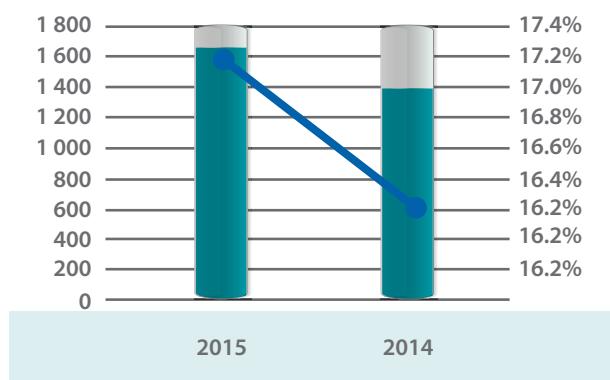
### IMPROVING MARGINS AND RETURNS

The net profit margin, gross profit margin and return on equity improved as a result of the group's increased revenue in the year, as well as its strict management of costs. Return on assets remained at 7% even with the high investment in infrastructure in the period.

### LIFTING CASH RESERVES

Earnings before interest, taxes, depreciation, and amortization (EBITDA) grew by 20% to R1.4 billion in 2015. (The EBITDA margin grew from 16.1% in 2014 to 17.2% in 2015.)

#### EBITDA margin



Net cash from operating activities increased 16.3% to R2.58 billion, supported by greater revenue. The amount of net cash utilised in investing activities increased 7% in the year (mainly due to the acquisition of property, plant and equipment), while we raised R1.17 billion in the bond market. The net effect was that cash reserves at year end were up by around a third to R1.15 billion (2014: R871.5 million).

### ADVANCING OUR CAPITAL INVESTMENT PROGRAMME

We continued to advance our capital investment programme designed to meet demand projections for water within Rand Water's area of supply. Capital expenditure (capex) increased 16% to R2.58 billion, supporting a 20.8% increase in the value of property, plant and equipment in the year.

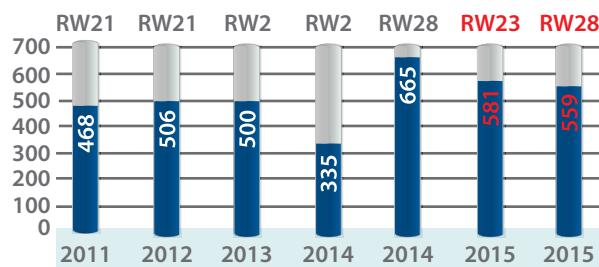
We forecast that we will spend R18.3 billion in capex between 2016 and 2020 on our existing business, 57% of which will be for augmentation and 43% for renewal projects. We also expect to spend more than R7.2 billion on growth projects (including those related to acid mine drainage) and R500 million on capital projects in Bushbuckridge.

It is Rand Water's policy to fund rehabilitation and replacement projects from internally generated funds (accumulated profits and cash reserves) after providing for the group's liquidity requirements. Through our domestic medium-term note programme, which was doubled to R10 billion in the year, we are able to fund the expansion of our network.

During the year we raised a nominal R581 million; through the RW23 bond which matures in 2023, and a nominal R559 million through the RW28 bond which matures in 2028.

Despite the increase in our borrowing programme, at 46.26% (2014: 29.32%) the Group's debt-to-equity level at year end remained below our target of 50%. This shows the capacity available to fund future spending. Our Shareholder and National Treasury have approved Rand Water's net approved borrowing limits for the reporting period of 2014 to 2018. The approved utilisation limits address Rand Water's core funding requirement of R5.8 billion at the time of submission for approval and the residual balance of R2.5 billion to cater for the growth investments. Hydropower projects require further approval on a project-by-project basis from National Treasury.

#### Total Bond Issuance to date



Net interest income increased to R79 million (2014: R71 million) as borrowing costs continued to be capitalised to qualifying assets. Capitalised borrowing costs in the year amounted to R266 million and are expected to increase in line with the roll out of our capital investment programme over the next five years. Standard & Poor's Ratings Services kept Rand Water's long-term foreign currency rating at 'BBB-'. It also maintained the long-term local currency rating at 'BBB+'.

In the year we had planned to launch the Water Demand Management Fund. Managed by Rand Water, the Fund started collecting from municipalities a charge equivalent to 1% of the tariff for 2014/15. However, the Shareholder put a stop to this charge, which meant that we had to house the R149.8 million in funding that we had already raised.

#### CREDIT MANAGEMENT

In addressing the concentration risk with our debtors, Rand Water has a credit management policy. We continue to be vigilant in managing our debtors and have set ourselves a key performance indicator of 33 days for debt collection. However, towards our year end in June, which coincided with their year-end of some of our municipal customers, we experienced some challenges in that some payments came in a day or two late.

#### POST-RETIREMENT MEDICAL OBLIGATION

In terms of our existing commitments to retirees with regards medical aid, Rand Water has an obligation to current and future 'continuation qualifying members' to pay the employer subsidy for medical aid.

However, subsequent to the year end, Rand Water concluded a policy to ensure that our ('the employer's') obligations or commitments to continuation members are met by the insurer, subject to the terms and conditions of this policy.

The purpose of the policy is Rand Water to transfer, and for the insurer to assume, the liability of Rand Water in respect of the total Rand Water subsidy, subject to the terms and conditions of the policy, with the proviso that to the extent

that the policy benefits do not meet for any reason the total Rand Water subsidy in full; Rand Water remains liable to the medical aid scheme in respect of continuation members for payment of any shortfall of the total Rand Water subsidy not met by the policy benefit.

#### GROUP SCHEME (DEATH AND DISABILITY BENEFIT)

Rand Water's employees belong to the Rand Water Group Scheme, underwritten by Old Mutual, providing death and disability cover for employees while they are employed by Rand Water. Both of these benefits are structured as unapproved arrangements. Life cover is four times employees' annual earnings and the lump sum disability benefit is also four time annual earnings, limited to R5 million.

#### THE RAND WATER PROVIDENT FUND

The Rand Water Provident Fund is administered in terms of Section 13B of the Pension Funds Act. Rand Water provides benefit administration and the financial services group Acsis Ltd (Old Mutual) provides investment administration services. Membership of the Fund is restricted to employees. The Fund is governed by a board of trustees, five of whom are elected by members and five of whom are elected by Rand Water.

During the year under review, the board of trustees held six meetings. In addition, two audit committee meetings and two investment committee meetings took place.

The Fund's objective is to provide retirement and other benefits for members, and benefits in the event of their death. There are three investment choices and three membership class options: Risk benefits are underwritten by Capital Alliance; Old Mutual and Infinite; The Fund's membership at year end was 2 873, and the Fund's value was R2.04 billion, up from R1.85 billion a year earlier.

The default investment strategy for the Fund is inflation plus 3-5% over any five-year period.

This is how our different strategies performed over a year.

Strategy	Cash Strategy	Inflation Matching	Inflation plus 3-5	Inflation plus 5-7
Yield	6.3%	9.5%	9.4%	9.6%
Benchmark	5.9%	4.6%	8.8%	10.8%

The underperformance of the inflation plus 5-7% strategy is the result of deteriorating returns in both local and global equity markets.

The 12-month local equity market returns have reduced significantly and the year to date returns are not much better than the annual cash return.

#### **MPUMALANGA EMPLOYEES PROVIDENT FUND**

In respect of our employees in Mpumalanga, Rand Water became a participating employer under the FundAtWorks Umbrella Fund on 1 April 2014. This Fund is administered by Momentum Life. Member contributions are 7% of salary while we contribute 7.62%, inclusive of costs.

As at 30 June 2015, the Fund's membership was 210 with an asset value of R34 million.

There is one investment portfolio, the Trustee Choice Portfolio, and its performance at 30 June 2015 was 6.56%.

#### **THE RAND WATER MEDICAL SCHEME**

The Rand Water Medical Scheme is self-administered and membership is restricted to employees and former retired employees of the group and their dependents. The Scheme is governed by a board of trustees made up of five people elected by members, and five elected by Rand Water. In the year under review, the board of trustees held six meetings. Its audit & risk committee and pricing & investment committee held two meetings respectively. At the end of the year, the Scheme's solvency ratio was 87.5%, compared to the statutory minimum of 25%. It covered 8 396 lives.

The Scheme continues to closely monitor developments relating to the introduction of National Health Insurance in South Africa, as well as amendments to the Medical Schemes Act.

#### **LOOKING AHEAD**

In the new financial year we will continue to work to deliver on Rand Water's development mandate, and secure the funds needed for our capital programme. We will also diversify our funding, including through the use of structured and project financing. In addition, our focus areas will be:

- ❖ Continued improvement in margins and returns, though at a slower rate;
- ❖ Implementation of a new operating model for Mpumalanga;
- ❖ Continued engagement with the Shareholder with regards the transfer of bulk water infrastructure to Rand Water in Mpumalanga; and
- ❖ Extension of the enhanced credit management process to our new service area.

**Matshidiso Nyembe CA (SA)**

**CHIEF FINANCIAL OFFICER**

**Glenvista**

**28 September 2015**

# Who we are

**Rand Water** is the largest water utility in Africa. Our customer base includes metropolitan municipalities, local municipalities, mines and large industries. We have an internationally acknowledged reputation for providing water of high quality that ranks among the best in the world. We have consistently met nationally accredited standards on water quality.

Our geographical expansion has seen us provide water and sanitation services in Mpumalanga, the Free State and North West provinces. With respect to expansion on the Continent, we study the bilateral and regional trade agreements entered into the South African government with a view to pursuing advantages that exist in those new markets.



## WHERE WE ARE BASED

- ⦿ Head Office in Glenvista, Johannesburg, South Africa.
- ⦿ Two large pumping and purification stations, at Vereeniging and Zuikerbosch.
- ⦿ Four main booster stations at Zwartkopjes, Palmiet, Mapleton and Eikenhof.
- ⦿ Thirteen tertiary pumping stations and a number of enclosed reservoirs and secondary booster stations.
- ⦿ A multi-billion rand regional pipeline network of approximately 3 500km.

## OUR FOCUS AND POSITIONING

- ⦿ We pride ourselves on the important role we play in the economic heartland of Southern Africa.
- ⦿ With our experience and excellence we are able to provide local authorities in South Africa and the region with solutions to their water sector challenges.
- ⦿ We are aware of the necessity to play an increasingly pivotal role in the water sector.
- ⦿ We intend to pursue growth within the mandate given to us by the Water Services Act.

## RAND WATER

The provision of high quality bulk water services.

### RAND WATER FOUNDATION

Through social partnerships; supporting communities in the management of water, sanitation and the environment.

### BULK SANITATION

Extending sanitation services to water service authorities and institutions within and beyond our traditional area of supply.



### RAND WATER ACADEMY

Addressing key human resource, technological and process challenges in the water and sanitation sector.

### SECTOR GROWTH AND DEVELOPMENT

Providing sectoral support in leadership, governance, financial management, operations and maintenance.

# Our vision

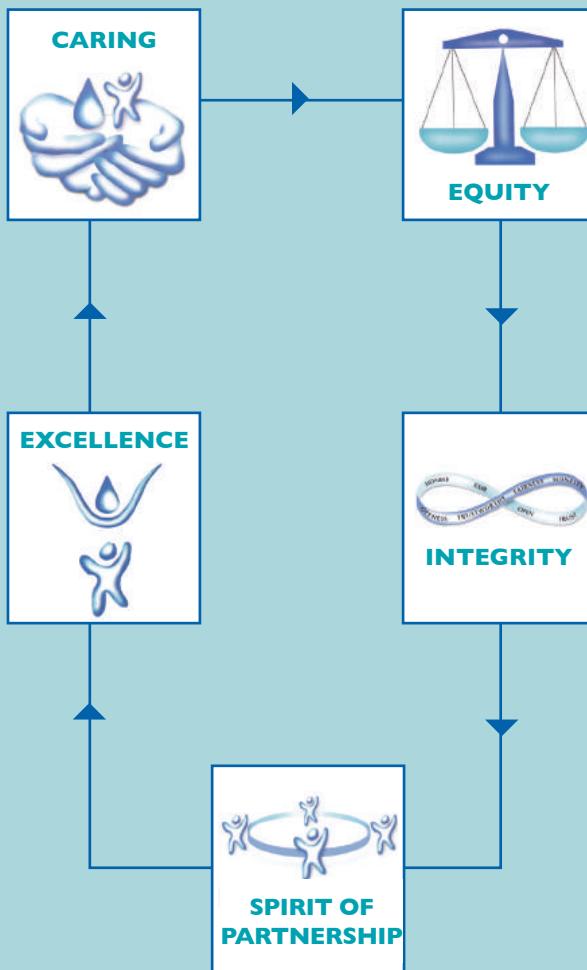
*To be a provider of sustainable, universally competitive water and sanitation solutions for Africa.*

# Our mission

*To deliver and supply world class affordable, reliable, and good quality water and related services to all stakeholders through:*

- *Safe, efficient transparent, sustainable and innovative business practices;*
- *Empowered employees;*
- *Mutually beneficial strategic relationships; and*
- *Legislative compliance and best practice.*

# Our values



## DELIVERING ON OUR STRATEGIC FOCUS AREAS

During the year under review, we made progress towards achieving our vision through delivery on our growth strategy of positioning Rand Water as the preferred water services partner. At our Board and Executive strategic planning sessions, we continued to refine our strategic focus areas in the context of our material matters.

We ploughed back our net income generated into upgrading and expanding infrastructure. We made good progress with our capital investment programme which was designed to meet demand projections. We will continue to work with our Shareholder, the Department of Water and Sanitation, on their development of national water pricing strategy. We remained committed to improving our processes and limiting expenses, in order to keep consumer costs contained.

# Our strategic objectives

In order to attain our strategic intent, Rand Water has set the following strategic objectives, which will focus and direct the business activities of the organisation over the planning period. Each of the Rand Water strategic objectives are underpinned by specific goals, defined key activities and targets.

These are broadly categorised as follows:

## ACHIEVE OPERATIONAL INTEGRITY AND USE BEST FIT TECHNOLOGY



- To ensure compliance to all statutory and regulatory requirements.
- To promote safety, health, environment and quality (SHEQ).
- To increase protection of Rand Water's assets and personnel.
- To ensure continuous supply of water to customers.
- To ensure the quality and reliability of Rand Water assets.
- To effectively co-ordinate Rand Water's information and communication technology and knowledge management.
- To maintain the quality of water.
- To improve internal processes within the Rand Water Group.

## ACHIEVE GROWTH



- To ensure that Rand Water infrastructure meets current and future demand.
- To promote growth through new areas of supply.
- To promote growth through new product streams.

## ACHIEVE A HIGH PERFORMANCE CULTURE



- To build integrity within the organisation.
- To build employee morale and satisfaction.
- To build internal skills and capacity.
- To retain employees through an attractive environment.
- To transform Rand Water's employee profile.
- To reflect demographics of area of supply.
- To provide required assurance at Board level.
- To retain Rand Water's institutional knowledge.

## POSITIVELY ENGAGE STAKEHOLDER BASE



- To promote and implement initiatives that have a socio-economic development impact.
- To reduce legal risk and thereby minimise the financial and reputational impact on Rand Water.
- To improve awareness of Rand Water to external stakeholders.
- To respond appropriately to Rand Water's environment.

## MAINTAIN FINANCIAL HEALTH AND SUSTAINABILITY



- To promote prudent financial management.
- To achieve optimal investment portfolio performance.
- To mitigate all financial risks for the Rand Water Group.
- To ensure that assets are fully utilised.
- To ensure that tariff is determined accurately from Rand Water's environment.

# Our business model

The following diagram presents a schematic flow of Rand Water's preferred treatment regime of the process from abstraction to the end consumer.



## RAW WATER

Water is abstracted from the Vaal Dam to be purified at the Zuikerbosch and Vereeniging Purification Stations.



## COAGULATION

Addition and rapid mixing of chemicals referred to as coagulants to form settleable flocs. Conventional treatment employs activated silica and hydrated lime.



## FLOCCULATION

Slow mixing of the water to assist the suspended particles to grow, forming heavier visible particles called floc.



## RESERVOIR

Water is pumped through a pipeline network to reservoirs for storage and final distribution to customers.



## TERtiARY DISINFECTION

Addition of sodium hypochlorite at the tertiary plants to prevent bacterial regrowth in the distribution system and to maintain good water quality.



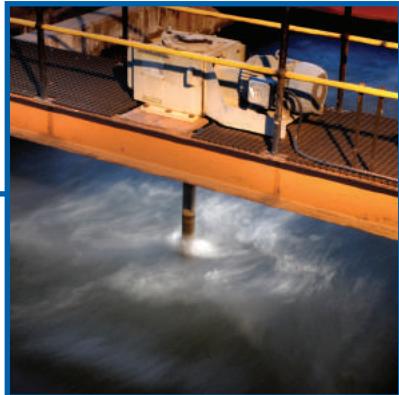
## Booster Pumping

After secondary disinfection, water is pumped several kilometers to the tertiary pumping station for further tertiary disinfection and pumping.



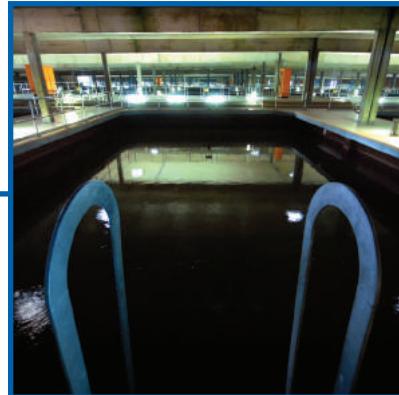
#### **SEDIMENTATION**

Flocs settle by reducing the velocity and the turbulence in specially designed tanks, also engineered to reduce sludge.



#### **STABILISATION**

Water flows into the carbonation bays where it is stabilised by bubbling carbon dioxide gas to reduce the pH of the water.



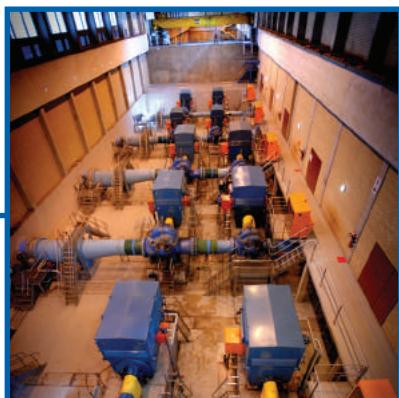
#### **FILTRATION**

Water passes through the filter houses where the remaining suspended matter is removed by straining the water through rapid gravity sand filter beds.



#### **SECONDARY DISINFECTION**

Once received at the booster pumping stations, chlorine and ammonia are added to form monochloramine, which protects the water against bacterial growth.



#### **MAIN PUMPING**

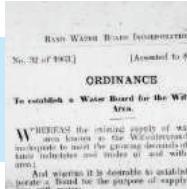
Water is then pumped from the primary disinfection plants, the Zuikerbosch and Vereeniging plants, and elevated by approximately 200m to the four booster pumping stations, namely Zwartkopjes, Mapleton, Eikenhof and Palmiet, situated in the southern foothills of the Witwatersrand.



#### **PRIMARY DISINFECTION**

The water leaving the primary purification works is disinfected with chlorine to kill any remaining micro-organisms, bacteria and viruses.

# Our **history** in the water sector



Rand Water established as bulk water supplier to Johannesburg. The first official board meeting took place on 15 May 1903.

Rand Water opens the Vaal Barrage. Barrage reservoir is 64km long with a storage capacity of 63m litres.

Construction on Rand Water's Vereeniging Pumping completed.

Construction of the Vaal Dam completed. The present Vaal Dam wall has been raised and can hold 662m cubic metres of water.

Zuikerbosch Pumping Station comes into commission.

The Tugela - Vaal Scheme completed allowing an amount of the water from the Tugela to be transformed into the the Vaal River System.

**1903**

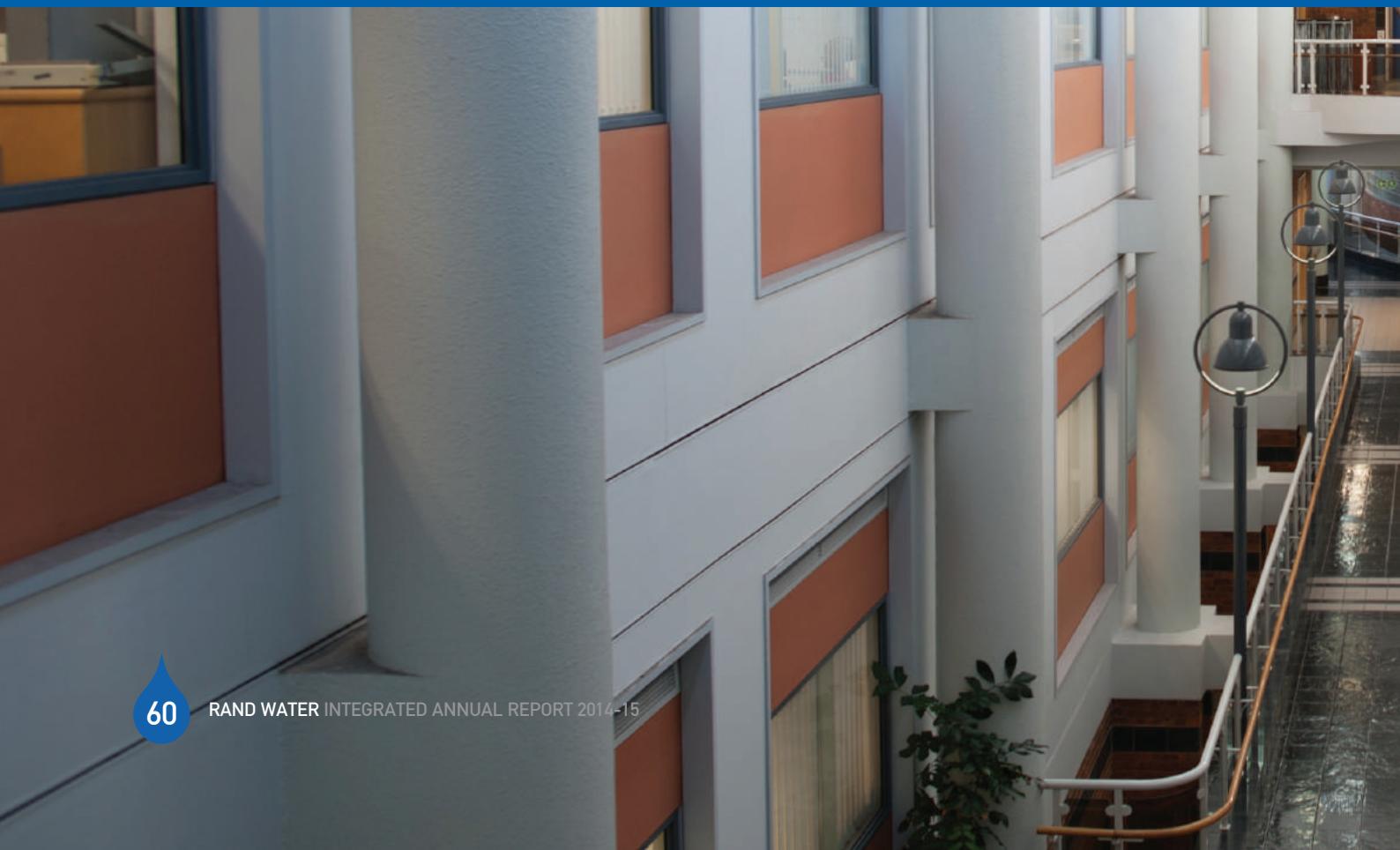
**1923**

**1924**

**1938**

**1949**

**1974**





Professor Kader Asmal becomes democratic South Africa's first Minister of Water Affairs and Forestry and appoints a new Rand Water Board.

The Water Services Act (Act 108 of 1997) is legislated.

Phase 14 of the Lesotho Highlands Water Project begins to deliver water to the Vaal River System.

Establishment of the Rand Water Academy.

Rand Water celebrates their 110 year anniversary.

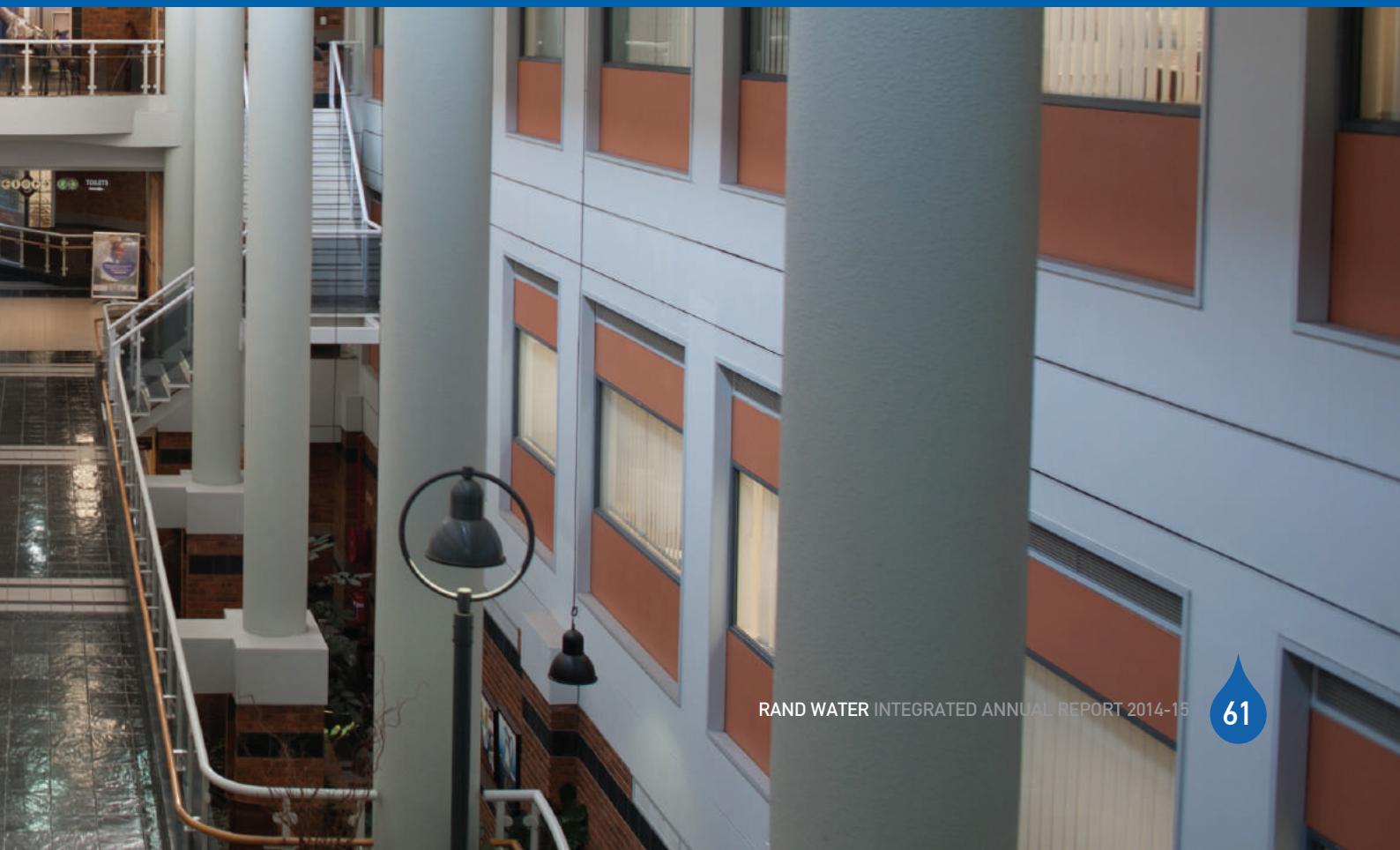
1994

1997

1998

2012

2013



# Our self-appraisal

In order to ensure that our strategic growth objectives are achieved and built on the solid foundation of our existing business, it is important for us to do a self appraisal of our successes. Our business and functions have continued to operate sustainably, underpinned by sound governance.



## CUSTOMER SATISFACTION SURVEY

Rand Water's supply to our customers is based on the Rand Water General Water Supply Conditions. Central to this is our customer satisfaction obligations. We continued to ensure that the organisation's reputation among our customers is maintained.

## QUALITY MANAGEMENT SYSTEMS

The successful maintenance of our ISO 9001:2008 certification during the year under review confirms the maturity level of our Quality Management Systems.



## RELIABILITY OF SUPPLY

We met all our daily peak demands during the year under review, thus abiding by our Bulk Water Supply Contracts.



## OCCUPATIONAL SAFETY, HEALTH AND ENVIRONMENT

The enforcement of Occupational Safety, Health and Environmental legislation has been embedded within our project management processes, from project-initiation to project-handover.



## BLUE DROP CERTIFICATION

We set very high standards for ourselves with regard to the supply and quality of potable water. In recognition of our work our Blue Drop Certification awards have increased during the year under review. We also received special recognition for helping municipalities achieve their Blue Drop status.



## HEALTH AND SAFETY

We continued to participate in, and support all the relevant HIV/Aids programmes and initiatives of government. Our site HIV/Aids Committees consist of committed staff, under the guidance of our Strategic Human Capital Portfolio.



## PRODUCT QUALITY

We continued to monitor the quality of our potable water against the national drinking water standard and benchmark our performance against the World Health Organisation (WHO) non-organic drinking water quality guidelines. During the year under review, we were consistent in maintaining delivery of drinking water meeting the SANS 241 national drinking water standard.

# Our key relationships

Rand Water recognises the significance of our stakeholders towards the sustainability of our business.



## OUR SHAREHOLDER

The Government of the Republic of South Africa, through the Department of Water and Sanitation, and duly represented by the Minister of Water and Sanitation, is our sole shareholder. The relationship between Rand Water and its Shareholder is governed by the provisions of the Water Services Act No. 108 of 1997.



## OUR BOARD

The Board of Rand Water is appointed by the Minister of Water and Sanitation and duly represented by the Department of Water and Sanitation, in accordance with the provisions of the Water Services Act No 108 of 1997. We have a unitary Board structure, which consists of a majority of non-executive members and an executive member. The positions of the Chairperson (non-executive) and that of the Chief Executive are segregated.



## OUR CUSTOMERS

Our customers include municipalities, the industrial and mining sectors. We interface directly with all our customers, notably through our regional account executives and water forums. We regularly solicit their feedback on our products and services.



## OUR INVESTORS

We keep our investors regularly updated on our financial position and other matters related to our business. We host roadshows with our investors and engage with the South African media on the release of our annual and interim financial results.



## OUR EMPLOYEES

Our employees remain central to our success. We communicate with our employees via weekly electronic newsletters, a quarterly newsletter and the intranet. Plans have been developed to engage our employees more intensively with regard to the sustainable development of our business.



## PROVINCIAL LEGISLATORS

We have built sound relationships with the provincial authorities within our area of supply. Our relationships have been largely collaborative, and we are in the process of formalising these relationships by signing Memoranda of Understanding between ourselves and the provincial legislatures.



## THE MEDIA

We continue to build on the recommendations made by our Board-approved Media Relations Strategy. We co-operate with both the print and electronic media based in South Africa and abroad on matters related to our product and services, governance, Rand Water Foundation (RWF) projects and brand marketing management.



## COMMUNITIES AND CIVIL SOCIETY ORGANISATIONS

Through our sponsorship policy, the work of the Rand Water Foundation and our Water Wise community based initiatives, we have garnered an incisive view of the needs and interests of the communities in our area of supply.



## TERTIARY INSTITUTIONS

Our work with tertiary institutions remains a priority for us with respect to attracting young professionals into the water sector. Rand Water supports Research Chairs at the Universities of Johannesburg and Pretoria.



## VENDORS AND SUPPLIERS

We promote the objectives of our Commercial Equity policy and have structures in place to ensure that our supply chain management process remains fair, transparent, equitable and cost effective.



## AUDITOR-GENERAL /NATIONAL TREASURY

As a public utility, we are accountable to both the Auditor-General and National Treasury. We report regularly on our financial and operational performance to both bodies.

# Our areas of operation

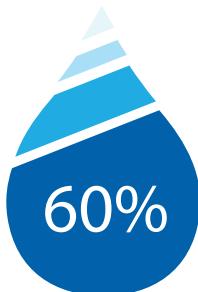
45%

of the population's water is supplied by Rand Water

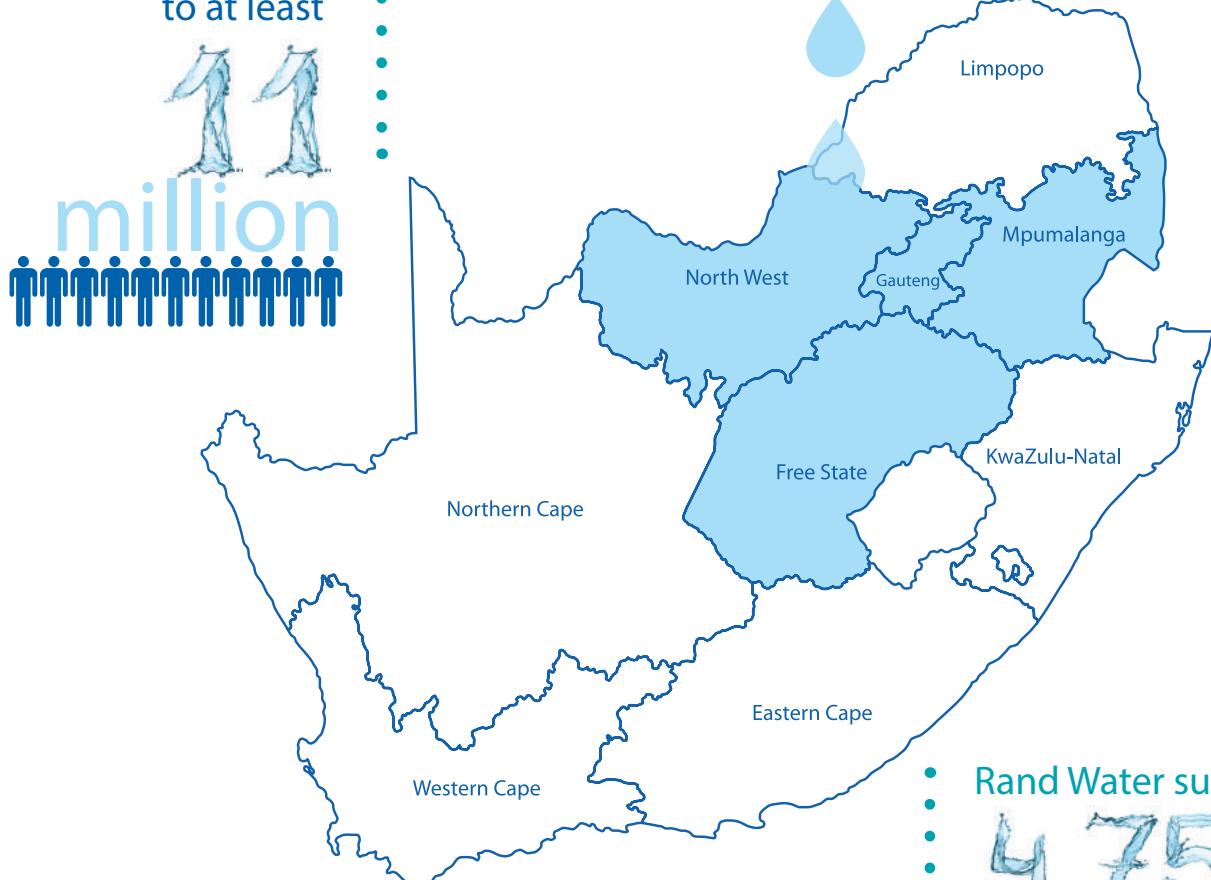
Rand Water supplies water to at least



million



Rand Water supports 60% of the country's economy



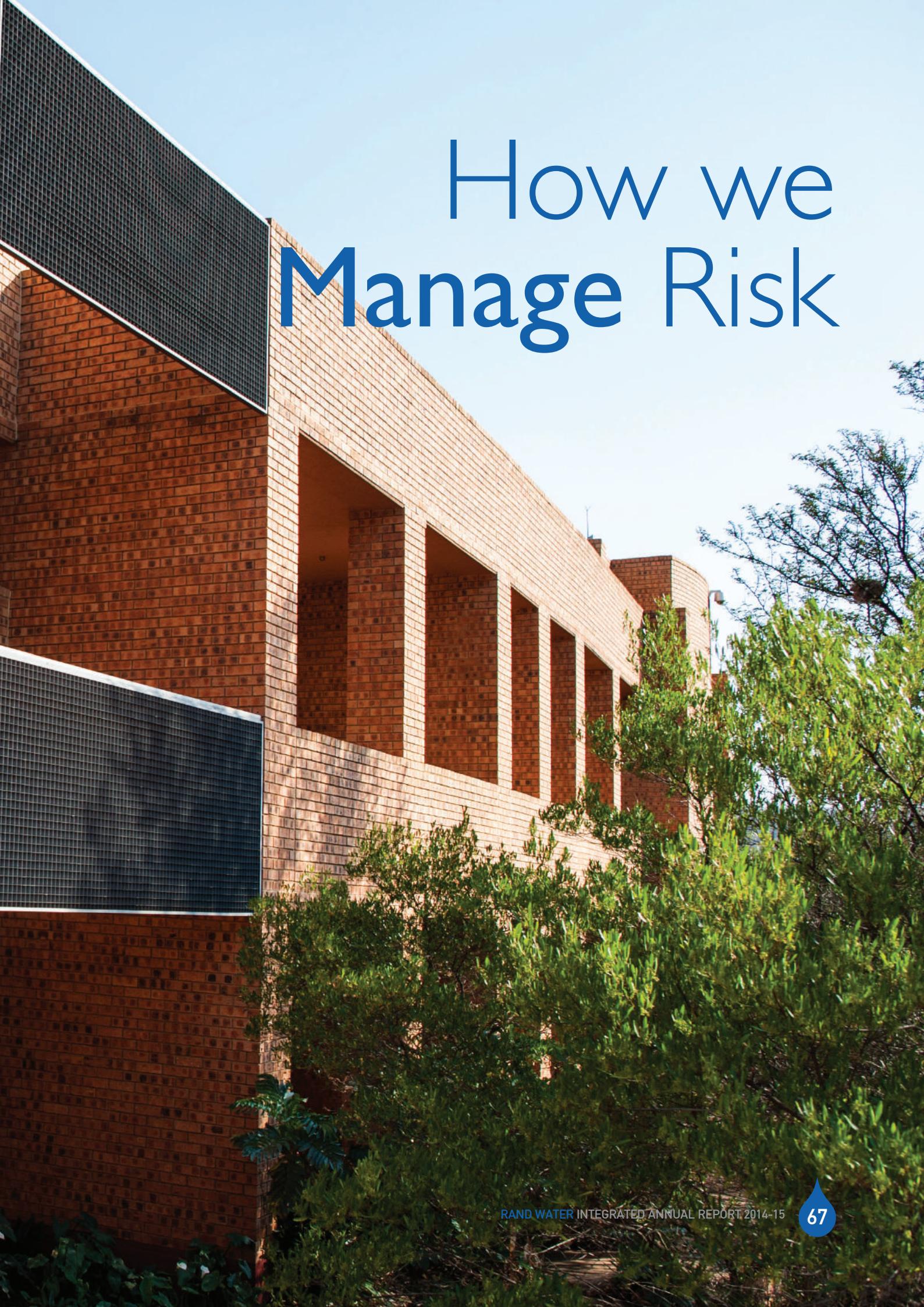
## 4 Provinces

Randwater serves 18 000km<sup>2</sup> - Gauteng and parts of Mpumalanga, North West and the Free State.

• Rand Water supplies  
4 757  
million litres per day







# How we Manage Risk

## **ENTERPRISE WIDE RISK MANAGEMENT**

The Board of Rand Water oversees the risk management process as per the King III requirement. The internal audit function provides assurance on the effectiveness of the controls.

The top ten risks that were perceived to have a potential to hinder achievement of the organisation's strategic objectives were identified, managed and monitored for the 2014-15 financial year. When the risks are effectively mitigated, the ability of an organisation to achieve our set objectives is optimised. It is very important that the controls designed to effectively manage the risks are cost effective, realistic and unambiguous. For the 2014-15 financial year 24 risks were identified. The top ten of those risks were identified against two strategic objectives. These strategic objectives are:

- (a) Achieve operational integrity and best fit technology; and
- (b) Maintain financial health and sustainability.

Four risks were identified against strategic objectives (a) and one of them materialised resulting in a water supply disruption and consequently reputational damage for Rand Water. The impact of the disruption was effectively mitigated and supply restored.

The top ten risks are captured in the table below. They are listed against the strategic objectives they are related to. The numbers 1 – 10 indicate their ranking in the risk register. It is important to note that these risks were prioritized based on inherent value.

[The Rand Water top ten strategic risks](#)

Risk Number	Strategic Objective	Risk Name
1	Achieve operational integrity and best fit technology	Capacity to supply / inability to supply potable water to clients
2	Achieve operational integrity and best fit technology	Encroachment over pipeline servitudes and properties
3	Achieve operational integrity and best fit technology	Deterioration in raw water quality
4	Achieve operational integrity and best fit technology	Reliance on critical suppliers
5	Achieve operational integrity and best fit technology	Extended area of service and products
6	Maintain Financial health and sustainability	Non-revenue water in the municipal system
7	Maintain Financial health and sustainability	Supply chain management process
8	Maintain Financial health and sustainability	Contractor management
9	Maintain Financial health and sustainability	Inability to obtain optimal tariffs
10	Maintain Financial health and sustainability	Fraud and corruption

*Spirit of  
Partnership*

*Excellence*

*Caring*

*Equity*

*Integrity*



## OCCUPATIONAL HEALTH, SAFETY, ENVIRONMENT & QUALITY (SHEQ)

In striving for excellence and continual improvement in the SHEQ field, the organisation further reduced its disabling injuries targets, compliance to environmental legislation and on increasing the use of improvement reports coupled with document control.

Over and above the SABS re-certification surveillance audits, third party, internal audits and legal audits were carried by the specialists in the relevant system. The results of all these audits were admirable in terms of compliance to all SHE legislation and to the ISO certification requirements. These audits also serve as a good tool to embed the culture of compliance to legislation as well as implementation of SHEQ best practices which result in a safe and conducive work place and surroundings. This SHEQ culture is being transferred to RW suppliers and customers. This is done through induction as well as inclusion of SHEQ requirements in all goods and services specification. It is a Rand Water standard that all SHEQ requirements are incorporated in the project management cycle process, namely from project initiation phase up to the handover of the project including the procurements process.

## SHEQ MANAGEMENT SYSTEM CERTIFICATION

We subscribe to the International ISO standards for Occupational Health and Safety, Environmental and Quality Management. As a responsible organisation, obtaining and maintaining certification provides assurance to stakeholders and enforcement agents that Rand Water complies with legislation, industry best practices. Rand Water is pro-active in maintaining production of a quality product and strives to promote the safety, health and well-being of its employees and to protect the environment. In the current year re-certification OHSAS 18001:2007 was done and recent surveillance audits were conducted on ISO 9001:2008 & ISO 14001:2004.

## CORPORATE ENVIRONMENTAL STATUS

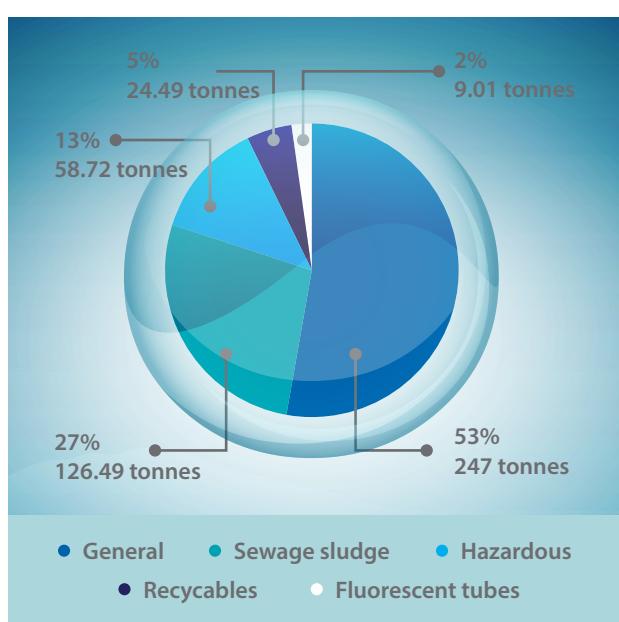
### WASTE MANAGEMENT

Our waste management practices continue to be in line with the corporate strategy direction and national legislation. The organisation supports the government's commitment to waste management in order to protect health and ensuring the protection of South Africa's environment as defined specifically in the National Waste Management Strategy, and Government's National Environmental Management Act, and in particular, the National Environmental Management: Waste Act, Act No. 59 of 2008.

A waste management service provider is contracted to render waste management services to all Rand Water sites for a period of 3 years. This includes the collection of general, hazardous and medical waste.

The graph below depicts the waste returns from all the Rand Water sites. This financial year's total figures are slightly lower than those of the previous year. This is due to all the recycling, training and awareness initiatives the sites have undertaken so as to reduce the amount of waste being disposed of in line with legislation and waste management good practices. The organisation continues to set objectives and targets so as to maintain the high standards achieved.

Rand Water Waste Returns



## RAND WATER DUST FALL-OUT

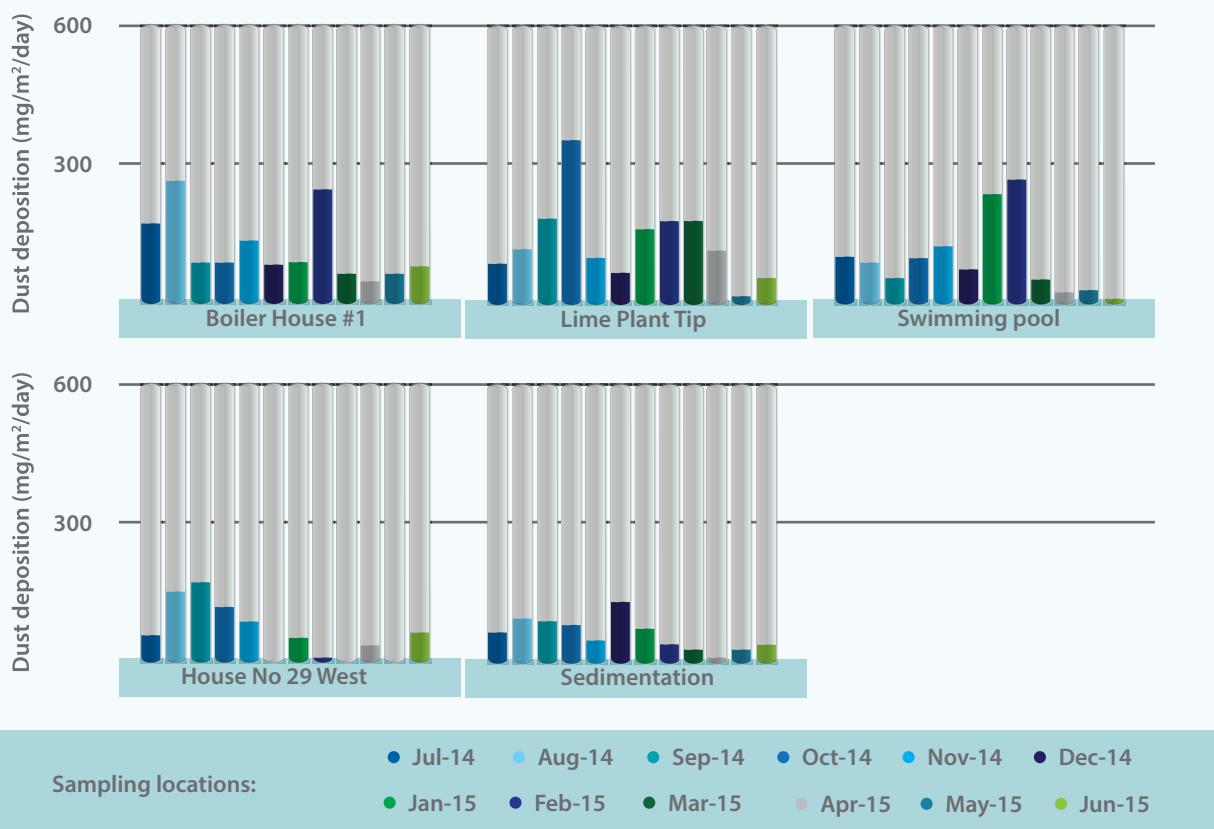
In 2006 the Minister of Environmental Affairs and Tourism declared the Vaal Triangle Air-shed Priority Area in terms of Section 18(1) of the National Environmental Management: Air Quality Act 2004 (Act No. 39 of 2004). Rand Water sites, namely Vereeniging Pumping Station and Panfontein, are both situated in the priority area and thus require specific air quality management actions.

Chemicals such as lime are utilised in the treatment of raw water. Water treatment residue is also produced as a by-product and disposed of at a registered site.

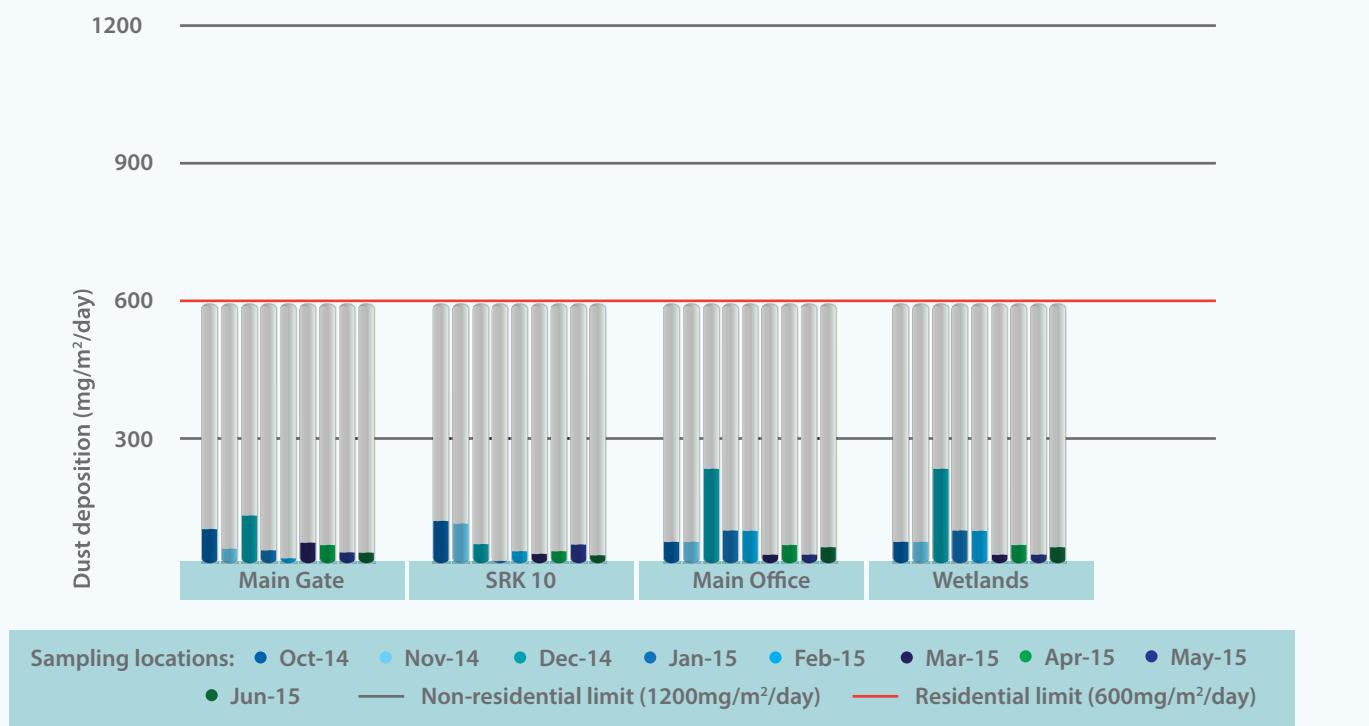
To achieve this dust fall-out had been monitored since 2010 at different locations at both sites so as to determine the levels of dust that arises from the organisational operations. The dust fall-out monitoring was based on the ASTM International standard method for collection and analysis of dust fall (ASTM D1739-98 (Reapproved 2010), with certain modifications.

It is evident from the results of monitoring and analysis of the dust fall-out that the dust arising from the Rand Water operation is far below the set thresholds of residential areas as well as the industrial areas. The results for the two sites are depicted in the graphs below.

Rand Water Dust Fall Out for Vereeniging Pumping Station



## Rand Water Dust Fall-Out for Panfontein

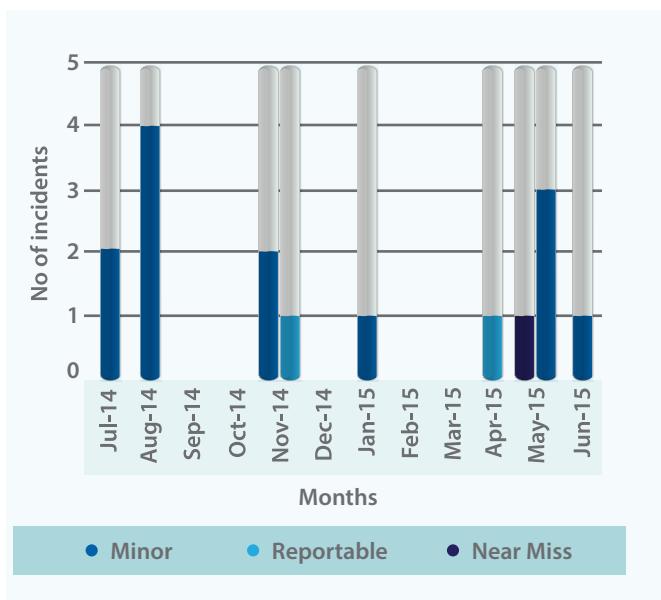


## ENVIRONMENTAL INCIDENTS

We aim to prevent environmental incidents on our entire site in adherence to our Occupational Health, Safety, Environment & Quality Policy. Our developed policies and procedures ensure that the risk of pollution or other negative impacts are minimised, and also ensure that proper reporting to authorities is done.

Inevitably, incidents do happen. All reportable incidents are fully investigated with a view to identifying the root cause and to put in place effective corrective actions to prevent them from being repeated.

In the current year, there were two such incidents as shown in the adjacent graph. Both these incidents had the potential of contaminating water resources. It is, however, encouraging to note the decrease in such environmental incidents from previous years. This progress is pleasing to the organisation and we remain committed to aiming for zero such incidents in the future.



**OCCUPATIONAL HEALTH AND SAFETY****- OHSAS 18001:2007**

In line with continual improvement the organisation further reduced the disabling injury rate (DIFR) target by 10.0% from 0.45 to 0.41. The actual performance for the period 2014/2015 was 0.28 DIFR compared with DIFR of 0.34 for previous financial year. This is a 17.6% safety improvement! (see attached Table 1). The ultimate goal is ZERO INJURIES at the workplace. These trends show that this ultimate goal is achievable. Some of the Rand Water sites have completed a year without any disabling injury and some have achieved one million hours without any disabling injury.

This improvement is also confirmed by the reduced number of claims from the Federated Employers' Mutual Assurance (FEMA).

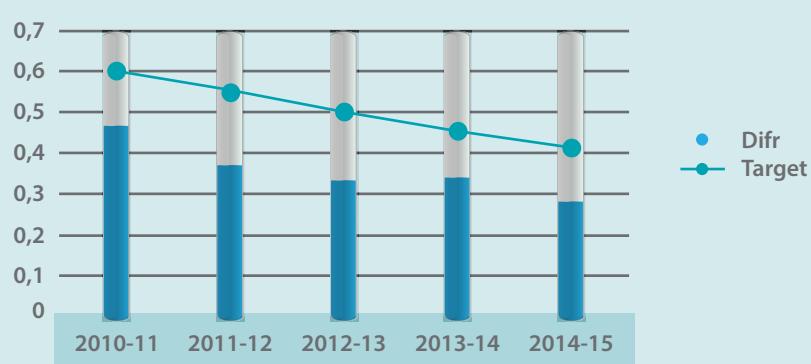
The Occupational Health and Safety (OH&S) program focused on the identified unsafe acts and conditions, including paying special attention to near-miss/near-hit incidents. The OH&S strategy concentrated on the task observation, mini-hazardous identification and risk assessment as well as incident investigations on all incidents occurring at the workplace. The OH&S program elements delivered a list of risk control measures as well as very effective action plans to prevent incidents from happening.

As the OHSAS 18001 certificate was due to expire in January 2015, intensive internal audits were carried out in preparation of the re-certification. SABS re-certification audits were held during the year and resulted in maintenance of OHSAS 18001:2007 certificate for the next three year cycle.

Year	Actual Difr	Target Difr
2009/2010	0,53	0,80
2010/2011	0,47	0,60
2011/2012	0,35	0,55
2012/2013	0,33	0,50
2013/2014	0,34	0,45
2014/2015	0,28	0,41

The graph below depicts the disabling injury frequency rates for past five years against the decreasing targets.

Rand Water: Disabling injury frequency rates per 200 000 man-hours worked



## **QUALITY MANAGEMENT SYSTEMS (QMS)**

### **- ISO 9001:2008**

During the period under review, Rand Water undergo the ISO 9001:2008 recertification audit which is conducted every three years. This audit was carried out by the South African Bureau of Standards (SABS), our current certification body. Recertification audits differ from surveillance audits, as they are detailed and all processes are thoroughly audited in ensuring compliance to the system. Rand Water Academy, Medical Aid and Provident Fund were selected for this recertification for the first time. Their inclusion was deliberately planned because these divisions have a lot dealing with external stakeholders. Robust preparation program by Rand Water personnel was undertaken by all sites.

Recertification was conducted as planned by SABS. Minor non-conformances raised have been adequately cleared by the SABS auditors and the organisation continues to comply with the ISO 9001:2008 standard.

Over the past year, partnership with the Policy Review Committee and Quality Management Office, has steered to positive results in ensuring that policies and procedures are standardised and communicated to the business. Document control is the backbone of the system and we strive to find better ways of embedding document control and management such as full utilisation of the electronic system. This will benefit the organisation by enhancing

document control, easy accessibility of documents, improve transparency between department/sites and compliance with the processes.

Challenges within the system are addressed by using the Improvement Report system which positively addresses non conformities by identifying the root cause of the problem, effectively implementing corrective and preventive action so that reoccurrences are minimised.

## **CONTRACTOR MANAGEMENT**

In line with the organisation's capital expenditure targets as well as in meeting the organisations GROWTH strategy a number of capital projects are undertaken to expand and maintain the integrity of our infrastructure to meet the nation's potable water and sanitation demands. The Board, the Executive Management and all involved in these projects are committed to ZERO INJURIES and ZERO degrading incidents as well as timeous delivery of these projects.

In pursuit of the above the Rand Water management teams continued to enforce compliance to legislation especially the Occupational Health, Safety and Environment (SHE) matters as critical facets of project management. The legislation and the organisation's SHE requirement has been integrated into the project management process from the project initiation to project hand over and closure.



Although, some challenges in data collection still have to be overcome, concerted effort continues to fully monitor the contractors' performance in all the facets of project management. Occupational Health, Safety and Environmental specifications are introduced from the design stage right up to the hand over stage. It is also well entrenched in all the tendering processes to ensure that SHE issues are well provided for and capacitated by the contractors awarded the projects.

Although, the year to date actual performance was 1.60, disabling injury frequency rates (DIFR) which shows an upward trend from the previous year's safety performance of 0.55 DIFR, the set safety target of 2.00 DIFR was not exceeded.

The trends showed that most incidents came from excavations, man-machine interface, inadequate & non-adhering with procedures.

In the reporting period two fatalities were sustained by our principal contractor's subcontractors. Both incidents were related with work in confined spaces. One incident involved a subcontractor;s is unauthorised attempt to operate a valve in a valve chamber infested by bees. The other fatal incident involved professional divers subcontracting to our principal contractor. They were involved in an activity to block and

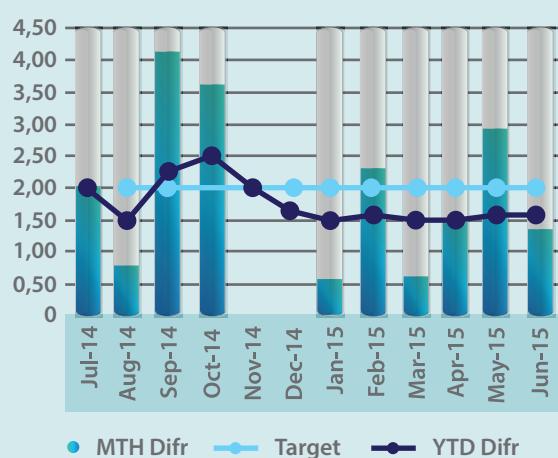
unblock sewerage pipelines "sealing bladders" in order to commission the sewer recirculation pipelines. The preliminary investigations showed that procedures were not adhered to when this activity was done. The diver was overcome by the high pressure of sewer, immediately the "sealing bladder" was broken, throwing him against the pipeline corners and he was killed.

In striving for improved safety performance on construction sites, the organisation has increased the number of resources to enforce legislation as well as best safety practices on the construction sites.

The organisation's risk sections have carried out over 3000 contractor and subcontractor employees' occupational health, safety and environment inductions, more than 700 contractor site inspections and attended over 300 projects and contractor SHE meetings. All these interventions by the organisation are over and above what the principal contractors have to do to render the construction sites free of hazards and risks.

In compliance with the new Construction Regulations 2014, promulgated in February 2014, the organisation continues to strive to implement all the requirements of the new regulations.

The graph below depicts disabling injury frequency rates.





#### **SHEQ ACHIEVEMENTS FOR THE YEAR**

- ❖ ISO 9001:2008 – Re-certification audits conducted and certification maintained for the next three years;
- ❖ OHSAS 18001:2007 – Re-certification and maintain;
- ❖ ISO 14001:2004 – Certificate successfully maintained; and
- ❖ Disabling injury frequency rate target of 0.41 met and performance improved from 0.34 to 0.28.

#### **OCCUPATIONAL HEALTH MANAGEMENT**

The Occupational Health Program aims to maintain the highest degree of employee wellbeing and minimise financial losses through maintenance of a safe and healthy workplace, targeted employee monitoring, and effective remedial actions to correct unacceptable deviances.

This is achieved through the provision of medical and technical expertise to achieve improvements in the working environment, adaptation of work to the individual worker, and promotion of the health and welfare of workers. In this way the services decrease the incidence of occupational injuries, diseases, deaths and related disability. The objectives are:

- ❖ To comply, as a minimum, with legal requirements regarding the Occupational Health and Safety Act (Act no. 85 of 1993) and Regulations;
- ❖ To continuously identify and assess occupational and environmental hazards and recommend actions necessary to eliminate or control these;
- ❖ To identify and manage adverse health effects arising from workplace conditions (including compensation and rehabilitation where possible);
- ❖ To encourage employees to maintain a reasonable degree of general health and fitness; and
- ❖ To achieve a high level of co-operation between management and employees on safety, health and environment control programs.

#### **OCCUPATIONAL HEALTH MONITORING**

The organisation's clinics continued with occupational health programs which commence at the employee engagement right up to the employment disengagement with the company. Any anomalies get reported to the Compensation Commissioner. In the reporting year no significant issues were diagnosed.

#### **OCCUPATIONAL MEDICAL PRACTITIONER'S CONTRACT**

The three year occupational medical practitioner contract came to an end during the year. A new occupational medical practitioner service provider was appointed through the procurement process.



# Our areas of Operations



## INTRODUCTION

In the 2014-2015 fiscal year Rand Water operations grew to even more municipalities within the Mpumalanga province through the Ministerial gazette that directed it as the bulk supplier to the province. This made Mpumalanga province the first province outside of Gauteng to receive the full suite of services offered by Rand Water. Bulk operations are now operating a number of major schemes to service the extended area of supply. The biggest is still the Vaal Scheme (supplying the Gauteng province and the provincial boundary municipalities), and in this financial year it supplied an average of 4 285 Ml/d mega litres (Ml) per day of potable water up from the previous years' 4183 Ml per day. The peak day demand was 4 962 Ml/day in October 2014, compared to 4 923 Ml/d in January 2014. The following schemes are operated in Mpumalanga namely Inyaka, Hoxane, Thulamahashe, Acornhoek, Sandriver, Edinburg, Shatale, and Marite supplying the Bushbuckridge Local Municipality areas and Kanyamazane (old & new), Nyongane, Mshadza, Mganduzweni & Dwaleli supplying the Mbombela Local Municipality areas respectively. All the Mpumalanga Schemes supply an average of 228 Ml/d of potable water. The Schemes are operated based on plants capability and not on based on demand.

Rand Water has always placed a very high premium on the quality of its water and as such has again provided water that met both the national drinking water standards as well as the World Health Organisation's drinking water quality guidelines. To ensure that Rand Water is able to sustain this performance into the future, it does not only rely on compliance monitoring but has implemented an extensive integrated water quality management plan which promotes multiple quality assurance checkpoints (multi barrier approach) throughout the entire water supply chain. This risk based system is able to proactively identify challenges and also employs pre-defined corrective protocols for those determinants that have the highest probability of failure.

The principle of "healthy catchments = healthy water" has been adopted by Rand Water as well and incorporated in the Water Quality Safety Plan in the form of a "catchment to tap" approach.

This approach encompasses the concerns and health of those consumers who drink the water supplied by Rand Water as well as the people living and working in the catchment who also depend on the source water for their livelihood. Deteriorating raw water resources have necessitated the installation of on-line monitoring devices at key points within the catchments from which we derive our drinking water to provide real time information on water quality.

In order to remain abreast of activities that may impact our source water quality, Rand Water also participates in all available catchment and national forums during which it lobbies its interest where water quality is compromised. An informed customer base is also important to Rand Water and in this regard the Reservoir website ([www.reservoir.co.za](http://www.reservoir.co.za)), which provides a wealth of water quality related information in respect of both drinking and source water quality, is maintained for public information. The website is extensively used by the public, research institutions, consultants and water quality managers. Rand Water has an impeccable reputation with regard to the provision of safe and healthy drinking water and intends to sustain this achievement into the future. Central to required quantity, quality, growth and reliable potable water supply is the operations portfolio which has four divisions as presented by figure no.1, designed to:

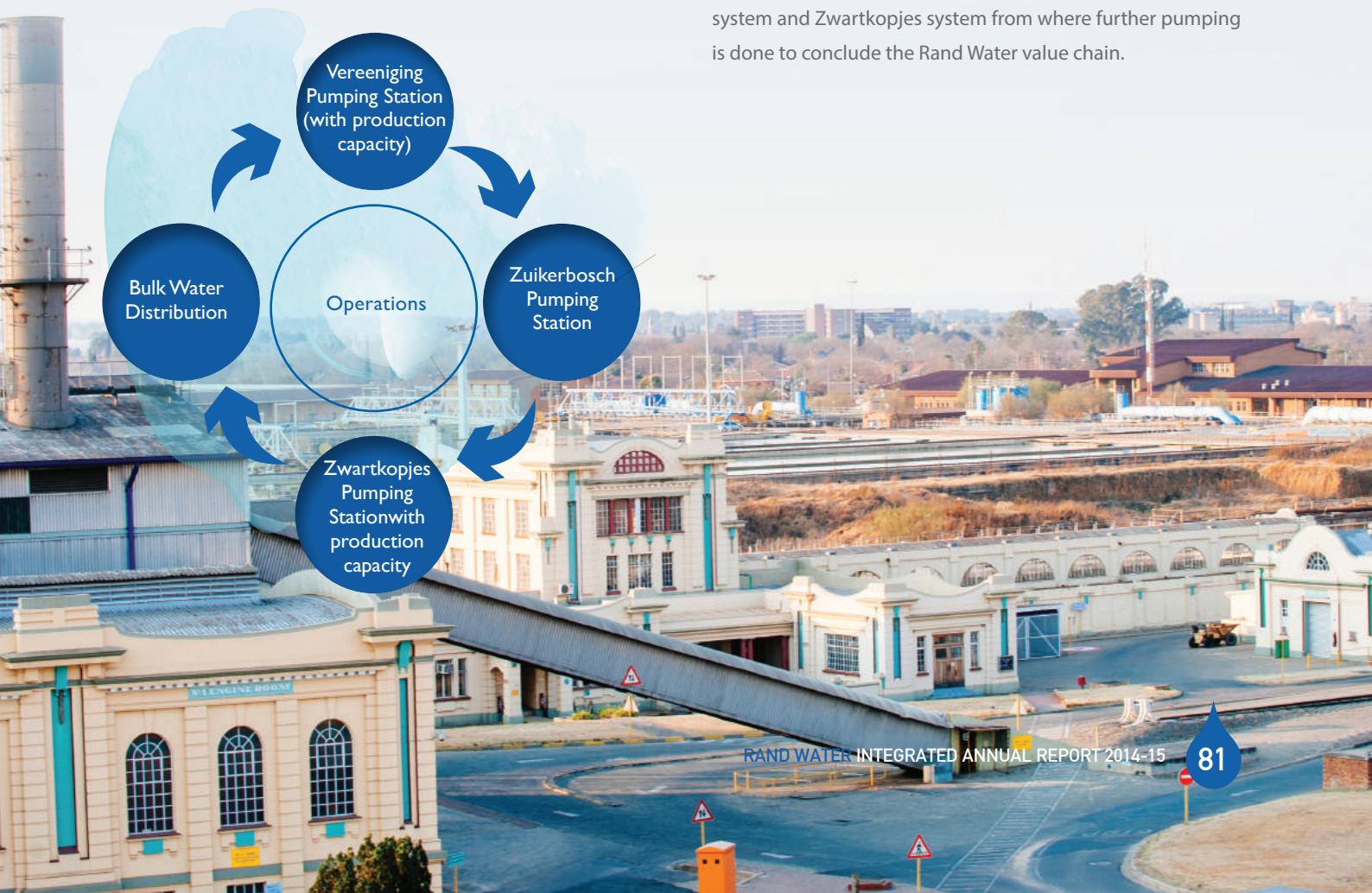
- Ensure reliable potable water production and logistics;
- Ensure world class quality potable water;
- Respond to business growth and revenue diversification; and
- Ensure proper systematic asset management.



## OPERATIONS

The main purpose of the operations division is to ensure reliable potable water production and logistics. Its responsibilities are abstraction, purification, treatment, pumping and distribution of potable water in compliance to SANS 241:2005 standards.

To achieve this, the division has carefully sourced employees who are passionate to be part of the team in Rand Water, responsible for maintaining its world class standard of providing the earth's most precious resource to our customers. As such, the approved staff complement of 1,897 in the Vaal catchment, consists of a range of diversely trained specialists in fields such as Engineering, Chemistry, Maintenance, Finance, Procurement, Risk, Health and Safety, Human Resources and Labour Relations. This was an important dynamic in the composition of the division, realising that an effective response to meet the growing future demands of the water industry will require effective leadership and innovative thinking. This staff complement is distributed across the critical infrastructure assets, three pumping stations (of which two have production capacity) and bulk distribution as presented by the figure below:



Over and above the infrastructure assets, other resources are distributed at two other support departments namely process department and divisional support.

## VEREENIGING PUMPING STATION

This was the first river intake pumping site, constructed and put into operation in 1924, situated 37km upstream from the Barrage and about 2.4 km from Vereeniging city centre. The Vereeniging Pumping Station continues to meet all Rand Water requirements with regard to potable water produced. The plant receives its water from the Vaal River catchment. The raw water quality is acceptable and fairly stable from this catchment. This plant is also able to abstract from the barrage catchment although this is not presently done due to the poor raw water quality.

The treatment plant's main purpose is to remove all suspended particles and the inactivation of pathogenic as well as the production of non-corrosive palatable drinking water according to Rand Water production specification and hence also meeting the SABS specification (SANS 241). The pumping plant objective is to pump the purified water to the Vereeniging, Vanderbijlpark, Sasolburg (VVS) system, Eikenhof system and Zwartkopjes system from where further pumping is done to conclude the Rand Water value chain.

The plant capacity has been increased over the years as water demand increased. Significant investment in upgrading production capacity to sustainably produce the quality and quantity required has taken place over the past decade. The plant is able to treat 1400Mℓ/d of purified water and pump 1800Mℓ/d. The plant is a 24 hour operation and has been used as a base load production of 1200Mℓ/d over the past year. Further updates on production capabilities are planned as Rand Water's needs change.

Annually, in line with Rand Water's infrastructure development plan, projects are initiated to upgrade and expand infrastructure at Vereeniging according to Rand Water's planning projections of demand. Due to the operating costs associated with Vereeniging and the space constraints, very limited expansion projects had been undertaken. However, many projects have been initiated and approved which focuses on plant life extension and reliability of potable water supply.

The total staff complement for Vereeniging is 464 and is responsible for all activities in areas of Administration, Operations, Maintenance, Process Quality and Risk Control Management, coordinated by a line manager.

#### **ZUIKERBOSCH PUMPING STATION**

In April 1949 Rand Water realised that the 1946 scheme (Vereeniging Station), was not sufficient to supply enough water to consumers after 1950, hence the establishment of the Zuikerbosch Water Treatment Plant. The Treatment Plant

officially commenced production on the 15th July 1954. At the time, the plant was established as a base station. As a result of its geographical location, the site cost of abstraction is low due to its water being gravity fed as opposed to electrical pumping to the treatment works.

Zuikerbosch Water Treatment Plant comprises four (4) Water Treatment Plants and associated pumping facilities. The main activity of the site is to abstract raw water, purify it to potable water standards and pump it into the distribution network. There are four (purification and pumping stations at Zuikerbosch. The different station capacities are:

Station 1: 480 Ml/d  
Station 2: 320 Ml/d  
Station 3: 1000 Ml/d  
Station 4: 1800 Ml/d

The site purifies and supplies water to all four booster plants of Rand Water i.e. Zwartkopjes, Palmiet, Eikenhof and Mapleton.

The total staff complement for Zuikerbosch is 487 and is responsible for all activities in areas of Administration, Operations, Maintenance, Process Quality and Risk Control Management, each area coordinated by line managers.

#### **ZWARTKOPJES PUMPING STATION**

Zwartkopjes Pumping Station is Rand Water's oldest booster pumping station, established in 1907 on the Zwartkopjes farm. It has under its control Palmiet, Eikenhof and Mapleton



booster pumping stations. All these sites are situated to the south of the Johannesburg within close proximity to each other. Zwartkopjes and its satellite pumping stations disinfect and boost the potable water pressures received from Vereeniging and Zuikerbosch Purification and Pumping Stations. Zwartkopjes and its satellite sites receive on average of 4350 Mℓ of potable water from Zuikerbosch and Vereeniging Purification Plants daily.

The following are the daily bulk distribution of potable water delivered by Zwartkopjes (760 Mℓ), Palmiet (1670 Mℓ), Eikenhof (1200 Mℓ) and Mapleton (740 Mℓ). Our primary functions as Booster Stations are to increase system pressures and effect secondary disinfection.

The total staff complement for Zwartkopjes is 381 and is responsible for all activities in areas of Administration, Operations, Maintenance, Process Quality and Risk Control Management, each area coordinated by line managers.

#### BULK WATER DISTRIBUTION

Bulk Water Distribution (BWD) is a Department within the Operations Division of Rand Water. BWD's overall responsibility is to distribute potable water of acceptable quantity and quality to Rand Water's customers at all times. This involves day to day operations and maintenance of 3500km of pipelines, 5 larger reservoirs, 13 tertiary pump stations and 5 tertiary chemical dosing plants. A total of 1600 Bulk Consumer meters are read on a monthly basis and these meters are the cash registers of Rand

Water. The customer profile consists largely of municipalities, mines and industries.

Bulk Water Distribution attained accreditation of one of its meter test rigs from South African National Standards (SANAS) organisation. A process is underway to get accreditation of the second meter test rig. The distribution area of supply is divided into three Regions, (West, South and North) which are further sub-divided into fourteen districts located strategically throughout our area of supply. These Regions, sub-divisions and responsibilities for districts are as follows:

#### North Region:

- Forest Hill, Germiston, Benoni and Esselen Park

#### South Region:

- Amanzimtoti, Meyerton, Barrage, Bloemendaal and Brakpan

#### West Region:

- Zuurbekom, Libanon, Krugersdorp, Waterval and Rustenburg.

All the functions and activities of BWD are managed and co-ordinated from a central location called Central Depot. This is the place where all other supporting sections are situated. The total staff complement for Bulk Water Distribution is 520 and is responsible for all activities in areas of Administration, Operations, Maintenance, Process Quality and Risk Control Management, each area coordinated by line managers.

#### THE PROCESS DEPARTMENT

The Process section is principally an inter-station function. It acts as support to the treatment, pumping and distribution sites as through waste treatment, performance monitoring and water quality services.

Waste is treated at Panfontein which exists to accept all Water Treatment Residue (WTR) produced by the purification stations, treat this waste product, reclaim the usable supernatant water and dispose of the resulting thickened WTR. It is the storage site for WTR, thus allowing the purification stations to be able to continue functioning effectively without concerns of WTR disposal.



Performance Monitoring and Enhancement section is responsible for the effective use of operational energy consumption within Rand Water in order to minimize cost and enhance competitive positions of the organisation. It manages all activities related to the consumption of the operational energy with the main focus on the elimination of waste, maximize efficiency and optimize supply of energy. This section is responsible for all spheres of operational energy management including: budgeting, budget control, pumping loads of the pumping stations to supply the consumer demand, including the budget for raw water, training, compliance to the acts, compliance to the SA Energy Efficiency codes and all technical aspects regarding operational energy management.

Water Quality Services Section is responsible for managing the procurement process for bulk chemicals from an operational perspective. It acts as the liaison link in the bulk chemical supply chain. This section prepares the annual chemical budget. In addition it manages water quality data from sites by trending, identifying and reporting areas of concern or non-compliance to specifications that may have long term effects on Rand Water's infrastructure.

### THE DIVISIONAL SUPPORT SECTION

The Divisional Support section provides advice and assistance to all sites/sections within the division on all matters pertaining to:

- ⌚ Finance such as budgets, variance reports
- ⌚ Business planning process
- ⌚ Project financing
- ⌚ Performance measurement
- ⌚ Service level agreements,
- ⌚ Delegations of authority
- ⌚ Audits
- ⌚ Inventory
- ⌚ Procurement

The section also offers support with regard to all Rand Water policies and procedures and SAP.

Together with the site Administration Managers and Risk Control Managers, this section ensures that common standards exist across all our sites/departments in order to ensure that the Division functions efficiently and effectively. This team

effort has been critical in bringing about consistency in the application of corporate standards and policies at all sites.

### SCIENTIFIC SERVICES

The main purpose of the Scientific Services Division is to ensure world class quality potable water. Its responsibility is to provide advice and services related to all aspects of water quality management for public health protection across the entire drinking water supply chain. It executes these responsibilities through a team of highly qualified 144 staff members. These staff members are distributed amongst the four departments within the Scientific Services Division. They are Analytical Services, Process Technology, Water Quality Specialist Services and Divisional Support Services. The success of these divisions lies in the teamwork. Each department within Scientific Services division plays a vital role in ensuring that they deliver according the slogan: "Quality water for life!"

### WATER QUALITY SPECIALIST SERVICES

#### Source Water Quality

The Vaal Dam is the hub of water supply in the Vaal River System. Rand Water, Sasol (Sasolburg and Secunda), Eskom and Mittal Steel, as well as, downstream users such as irrigators, Midvaal and Sedibeng Water, are supplied or supported with water released from Vaal Dam.

The quality of the region's water resources is continuously under the spotlight and received extensive media attention throughout the year. This was as a result of a number of incidents and discoveries made that caused major concerns about the efficiency of the management structures and interventions related to water resources.

The decanting of acid mine drainage from various mines in the Johannesburg region remained high on the agenda, and numerous television and radio programmes covered the matter. The decanting of this water presents serious threats with respect to possible sinkhole formation and obviously the pollution of receiving streams. The short-term solutions to both the Western and Central Basin decanting have been successfully implemented. This involves the neutralisation of the acid mine water in these basins and discharging the saline water into the Tweelopiespruit, and Klip River respectively. The neutralisation plant at the Eastern Basin site near Springs is

under construction and should be commissioned early in 2016. The Central Basin plant started to discharge in June 2014, and a general increase in the salinity of the Klip River and the Vaal River Barrage reservoir has been observed.

An additional concern with respect to acid mine water is the rapid establishment of new mines and the high number of pending mining applications for new coal mines to satisfy Eskom's increased demand. Most of these mines are in the upper reaches of the Vaal River's catchment, and will significantly impact upon Rand Water if pollution cannot be curtailed.

Sewage contamination remains a major concern, apart from the treatment works operated by the larger metros. The majority of the works in the catchment area are operated at a level where effluent of unacceptable quality is discharged into the environment.

As a result, Rand Water has increased its sampling frequency at identified high risk Waste Water Treatment Works (WWTWs) to ensure the safety of its consumers. Fortunately, the mere size (surface area and dilution volume) of the Vaal Dam acts as a natural risk mitigating factor against microbial pollution.

#### **Catchment Management**

Source Water Quality staff actively engage with stakeholders at Catchment Forum level to address water management issues. Water quality reports are produced and discussed, highlighting both "hot spot" issues as well as cumulative trends in water quality. These reports are also shared with DWS and are published on the [www.reservoir.co.za](http://www.reservoir.co.za) website.

Rand Water is represented on the Steering Committee for the establishment of the Vaal Catchment Management Agency (VCMA), as the protection of its source waters is vital to its ability to provide an uninterrupted supply of world class potable water. The Minister aims to have the CMA established by the end of 2016. As a first step, the CMA activities have been ring-fenced within DWS and identified staff have been delegated with the relevant functions.

Due to the prominence and successes of Rand Water, the Minister of Water and Sanitation has directed Rand Water to also take over catchment management functions in Mpumalanga as part of the expansion in this area of service.

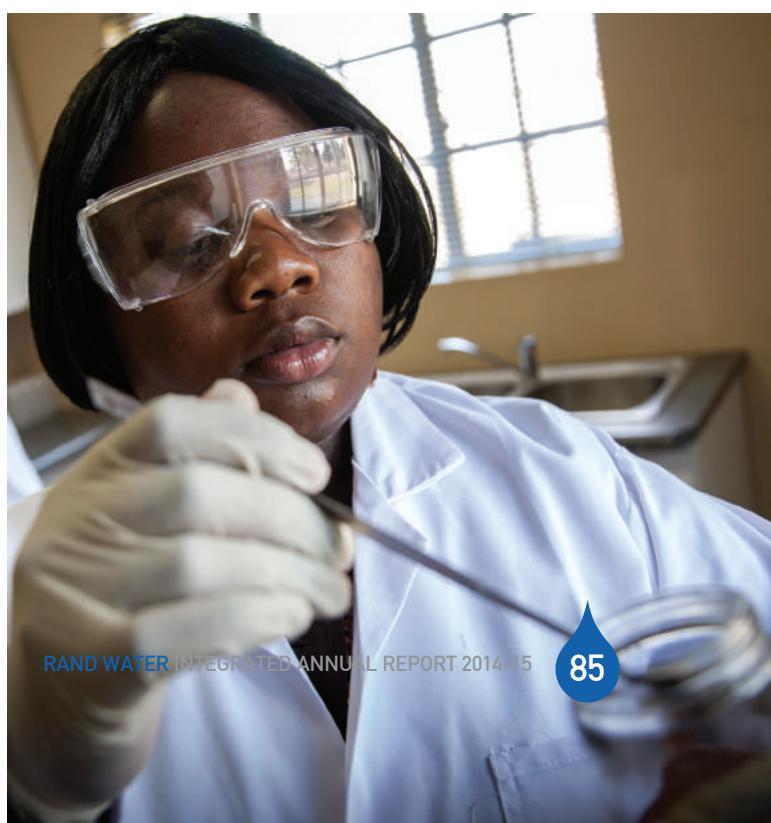
However, the Inkomati-Usuthu CMA (IUCMA) already exists in the area, and covers most of the Mpumalanga province. In this regard, Rand Water met with the IUCMA to establish a cooperative relationship that will be mutually beneficial.

#### **Eutrophication and the Vaal Barrage**

Although there has been a general improvement (mainly due to the engagement of Rand Water staff with authorities and stakeholders), spillages of raw sewage continued to affect the Barrage reservoir with high levels of nutrients and faecal bacteria.

Although an improvement in the effluent from some sewage treatment plants has already been observed, spillages still arise from pipeline bursts and pump failures. The improvements can be ascribed to Rand Water's vigilant monitoring and reporting of spills, combined with the "Green Drop" assessment by the Department of Water and Sanitation. Rand Water's Bulk Sanitation department has also been appointed as management contractors by the Emfuleni municipality, to operate the three sewage treatment works in the area on its behalf. Unfortunately, some of the semi-formal areas seem to be under permanent threat as sewer lines are in such a poor state that permanent spillages and flooding are the order of the day.

Community unrest has also had an impact on civil work as part of the upgrading of certain WWTWs, as local residents protested and insisted on being hired by the contractor, and blocked access to the site, delaying progress by about six months.



Compliance to effluent standards has increased significantly at some WWTW's. The fact that action is being taken as a result of public pressure is comforting. It is also an indication that awareness levels among the general public are fairly high. People are making use of the catchment forums, and information made available by Rand Water, to inform and educate themselves.

#### **Monitoring**

The rivers and dams in the catchments of Rand Water's area of interest are extensively monitored and a great deal of effort goes into communicating the water quality status of the catchments to the consumers. This takes place through involvement in each and every Catchment Forum and the website, ([www.reservoir.co.za](http://www.reservoir.co.za)) which is maintained by Rand Water. Rand Water fulfils the role of independent water quality "auditor" and facilitator in these forums, as it has the most comprehensive database of chemical, biological, and microbiological data. There exists a high level of trust between Rand Water and the public.

As a result of the increasing water quality problems, economic pressures and uncertainties surrounding incidents such as fish kills, Rand Water installed a number of real time electronic monitoring units at selected sites in the Vaal and Wilge Rivers and the Vaal River Barrage Reservoir catchments. These instruments measure flow at weirs as well as selected water

quality variables. The instruments are linked to data loggers, equipped with cell phone technology, via which the data is sent to a central server. This information is available in real time to staff in the Water Quality Specialist Services Department of Rand Water.

This system vastly improves response time to pollution incidents, as well as significantly improves Rand Water's information base, which contributes to a better understanding of the dynamics of the Vaal River system. Some examples of such improved knowledge base are the recent flooding in the Vaal system, the occurrence of fish kills and tracking the impact of Acid Mine Drainage (AMD) on the receiving system.

During the year, Rand Water also completely revised its catchment monitoring programme, to be more focused on challenges and aspects that could directly compromise the organisation's ability to provide potable water of the highest standard.

#### **The Vaal Dam Catchment Area**

A number of water quality issues have been identified with regard to the current water quality status in the Vaal River system. Some issues impact the full length of the Vaal River while others are localised in nature. The overall trend in the Vaal River system is one of increasing salinity levels all of which have and will continue to have an impact on raw water

quality supplied to the Vaal Dam and therefore ultimately on Rand Water's operations.

The increase in Total Dissolved Solids (TDS) and concomitant increase in constituents such as chloride and sulphate has major implications on domestic, industrial and agricultural water users. The occurrence of microbiological pollutants as localised problems is also a continuous concern. This is indicative of sewage works and related infrastructure not being properly operated, managed and maintained. Coal mining activities in the upper reaches of the Vaal River are rapidly increasing. In addition, a large number of additional applications for mining rights are being processed by the relevant government departments. These are already impacting on the water quality of the Vaal River, and, if not regulated effectively, will have similar effects on the river than what the coal mining in the Witbank area had on the Olifants River (where crocodiles died as a result of poor water quality).

Eutrophication is the other key water quality challenge in the Vaal River System and has resulted in algal blooms and growth of water hyacinth. Of importance is the fact that these blooms are occurring more frequently and more severely than what was historically experienced. Impacts have also resulted in economic implications for water users and large expenditure to control it.

Municipal wastewater effluent is the principal contributor to eutrophication and degradation of the Vaal River aquatic system, it is also one of the impacts that is easily mitigated because they are easily identified, measured, and susceptible to control by policies and regulation. A number of directives have been issued by DWS to some of the municipalities in the catchment, instructing them to improve their effluent management from waste water works. Unfortunately this has not had the desired effects.

In the long-term, increased pressure is expected from population expansion and development in the Vaal River catchment, which in turn will increase pollution levels. This in turn will necessitate additional measures and strategies to maintain acceptable pollution levels in the Vaal River system.

Law enforcement regarding pollution has been a challenge for many years. A lack of human resources in government departments is the biggest concern resulting in them being unable to police the Vaal Dam catchment. It is only through continuous actions of the catchment forums, Rand Water staff and other stakeholders, that these problematic areas have been highlighted and are now gradually being addressed by the Department of Water and Sanitation and local municipalities. The establishment of the Blue Scorpions has unfortunately not had any significant effect yet, largely due to capacity problems.

Serious attention should be given by municipalities to upgrade the sewage infrastructure, minimize the ingress of storm water into the sewer systems during high flow events, and minimize operational spillages. Improved quality of the sewage effluent will contribute to the environmental sustainability of the Vaal River ecosystem.

#### **The Vaal Barrage Catchment Area**

The Vaal Barrage catchment receives extensive volumes of water from point source discharges. The point source discharges include the major wastewater treatment works run by Johannesburg Water, ERWAT and Metsi-a-Lekoa as well as discharges from gold mines. The bulk of the salt load from



defunct mines is being discharged from the Central Basin and into the Vaal Barrage catchment area. There are also industrial effluent discharges, the largest being from SAPPI Enstra, Sasol (Sasolburg) and the storm water runoff from Mittal Steel Vanderbijlpark. The discharge volumes from the wastewater treatment plants will grow with time as the water requirements grow and the level of services are improved with the expansion of water borne sewerage systems in the urban areas.

The two most important water quality issues to be managed in the Barrage catchment for most of the sample points are biological (in the form of faecal coliforms) and chemical (in the form of gold mining and industrial impacts through manganese, sodium and sulphate). The threat of acid mine drainage (AMD) will be partially mitigated through the implementation of the short- to medium term interventions by the Department of Water and Sanitation. Although the acidity and heavy metals are neutralised and removed from the water, the discharge is still highly saline, with total dissolved salts (TDS) values in excess of 2,500 mg/l. Irrespective of the quality of such water, these discharges will have major effects on the overall hydrology of the catchment.

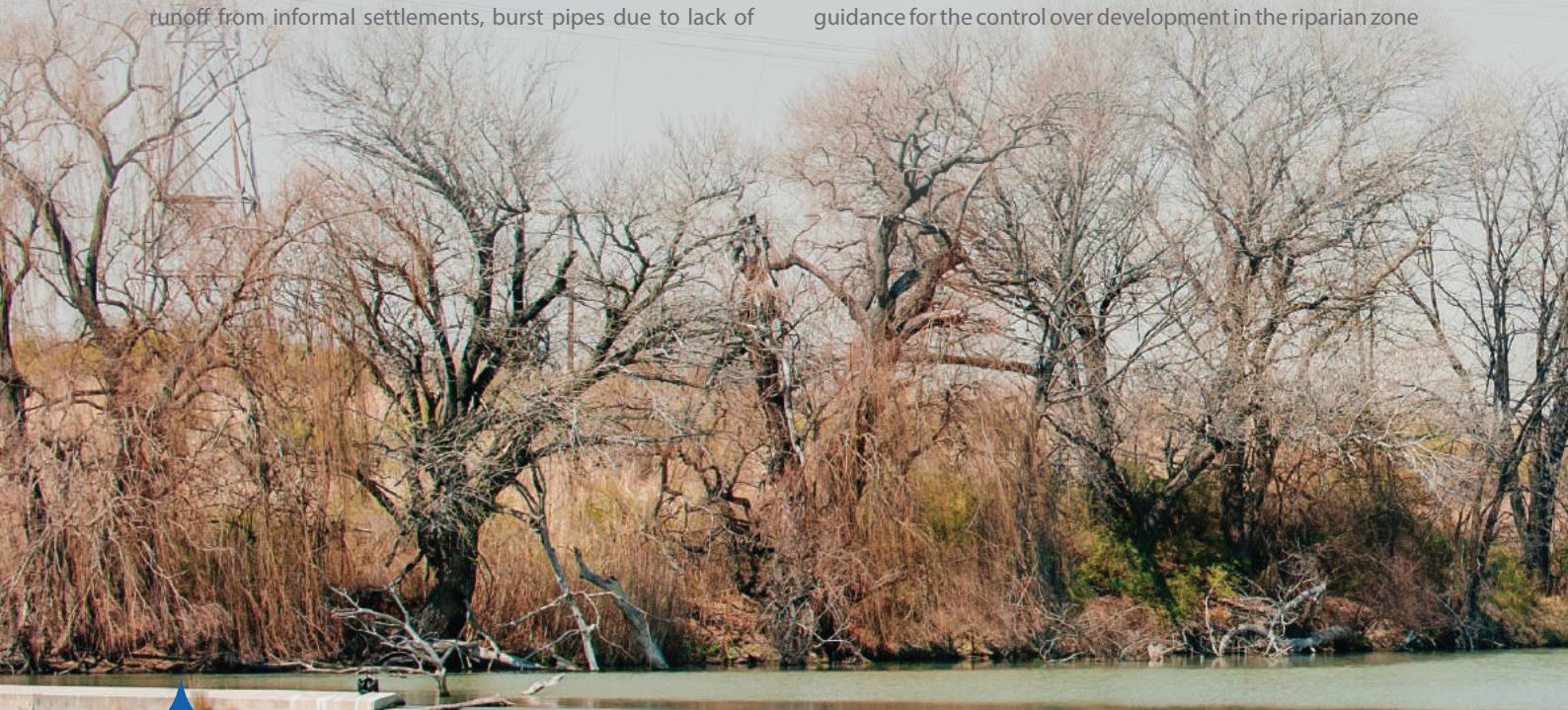
The more difficult issue of water quality management is that of controlling diffuse sources of pollution. In this regard, the biological impact of uncontrolled wastewater runoff from informal settlements, burst pipes due to lack of

maintenance and general lack of waste management has seen a deterioration over the year in biological water quality. This can and will lead to potential harmful effects on the human populations who use the Barrage catchment river systems for domestic and recreation uses. The occurrence of high numbers of E.coli, Giardia and Cryptosporidium cysts in all the tributaries of the Barrage is major cause for concern.

Burst manholes in the catchment and poor infrastructure maintenance result in the continual discharge of raw sewage into the river systems of the Vaal Barrage.

Regarding the eutrophic status of the Vaal River system, the Vaal River downstream of the Vaal Dam is severely impacted resulting in degradation of ecological integrity. It must be noted that the Vaal Barrage catchment is described as a serious "hotspot" with the highest levels of pollution (bacteria, algae, heavy metals, salts and nutrients) recorded throughout the entire Vaal River system. The pollution levels in the Klip River and Rietspruit catchments of the Vaal Barrage catchment are unacceptably high and the scale of nutrient inputs far exceeds the capacity of the natural environment to assimilate the waste discharged into these river systems.

Rand Water still successfully and vigilantly implements the Vaal River Complex Structure Plan of 1996, which provides guidance for the control over development in the riparian zone



of the Barrage reservoir. The purpose of the structure Plan is to protect the river from dense urbanisation on the banks, which presents a pollution risk to the water. Although the Structure Plan requires consensus for the approval of development plans from various municipal and government offices, Rand Water is often the only party to oppose development and accordingly has been experiencing more and more pressure to relax its stance in this regard. In the interest of protecting the Vaal River system, however, Rand Water has maintained stringent application of the relevant legislation.

As part of its commitment to providing factual and relevant information, Rand Water staff regularly provide input and comment on various Environmental Impact Assessments (EIA's) that occur within its area of interest. This is done by linking with various departments within the organisation to provide effective comment to the EIA process thus ensuring that water resources are effectively protected and not significantly degraded through developmental impacts.

Whilst formal channels, such as the EIA process allows Rand Water to interact with stakeholders and developers, more informal interactions take place on a daily basis where staff are on site investigating pollution incidents, meeting with municipal staff or providing direct assistance to stakeholders. It is through these interactions that a high level of trust has been developed between Rand Water staff and the public often to the point where Rand Water has been asked to mediate between disputes. Numerous requests for Rand Water data are also received on a regular basis to assist in

solving pollution incidents as the organisation's information is viewed as being credible and unbiased.

#### **Production Water Quality Assurance**

Rand Water has extensive monitoring capacity consisting of three ISO9001:2008 certified site labs, over 500 online instruments and an ISO17025:2005 accredited laboratory. Extensive monitoring programmes have been documented and complied to. The online instrument upgrade programme for the two production sites of ZB and VG have been completed. An online instruments upgrade programme is in progress for the Booster sites. An online instrument upgrade programme is being planned for the distribution network.

#### **Water Quality Management System**

Rand Water is committed to a documented systematic risk based water quality management system. In line with this, a Water Quality Safety Plan (WQSP), which is based on Hazard Analysis and Critical Control Point (HACCP) and ISO9001:2008 principles, has been documented and the fourth revision completed as part of continuous improvement. A detailed water quality risk register has been established and the fourth revision completed. In addition, an organisation wide multi-stakeholder water quality management standing committee has been functional for the last 12 years, which meets on a monthly basis. The organisation is audited by the Department of Water and Sanitation for Blue Drop certification.

Historically, the performance has improved with every Blue Drop audit.

## **Water Quality In The Bulk Distribution Network**

### **Water Quality Supply to Local authorities**

The supply of good quality potable water is of highest priority to Rand Water. To this effect, Rand Water provides water that is safe for human health for lifetime consumption. Rand Water places a high premium on public health protection. To ensure this, Rand Water has adopted the SANS 241 drinking water quality standard for compliance with national legislation for the delivery of safe drinking water to local authorities and commitment to Blue Drop Regulation certification requirements. This was achieved by implementing stringent water quality monitoring and assessments throughout Rand Water's entire supply chain. The drinking water quality delivered to Rand Water local authorities during this financial year was of excellent quality. All physical, chemical and biological health related parameters were compliant to SANS 241 drinking water quality standard. To enable improved water quality monitoring, an online instruments upgrade programme is in progress for the Booster sites. Additionally, a project to install online instruments in the bulk distribution network is currently underway. This will enable continuous monitoring of water quality in the entire bulk distribution area resulting in improved decision making.

### **Water Quality Benchmarking**

One of Rand Water's water quality verification activities is to benchmark itself against international organisations to ensure that the current activities are in line with the industry best practises. In order to conduct water quality benchmarking, Rand Water has selected the World Health Organisation (WHO) water quality guidelines to benchmark itself against. Rand Water's results during this financial year and the past years compared favourably with the WHO water quality guidelines.

### **Independent External Audit on water quality supplied**

To ensure confidence of customers in the quality of the water supplied by Rand Water, an independent water quality audit is conducted monthly. This is another safety barrier that Rand Water has put in place to reinforce customers' confidence that the water that they receive from Rand Water is indeed safe for human consumption. The organisation subjects itself to an independent system to assess water quality supplied to

local authorities via an external party. This audit is facilitated by an external ISO 17025:2005 accredited analytical facility (auditor) who performs all the required South African National Standard (SANS 241) for drinking water analyses on randomly selected samples within our supply system on a monthly basis. The selected company acts independently of Rand Water and any parties that conduct water quality monitoring in Rand Water's distribution network. During the current financial year, the Council for Scientific and Industrial Research (CSIR)'s Analytical Services team was used. The results obtained by the auditor (Table 3) as assessed against the SANS 241: 2006 national standards indicate that Rand Water has delivered safe and wholesome water to its customers during the 2014/2015 financial year. Additionally, Rand Water routine results compared favourably with the findings of the independent water quality audit. This indicated that the Rand Water Analytical Services continues to produce credible water quality results to customers

### **Organic contaminants**

The occurrence of organic contaminants in the drinking water value chain (from source to tap) is a growing concern for the drinking water industry and its consumers given the adverse health risks these contaminants can cause to the general public. These adverse health effects include endocrine disruption, toxicity, teratogenicity, mutagenicity and carcinogenicity. In the interest of public health, monitoring programmes have been developed for an extended list of potential organic contaminants. The identified organic contaminants include industrial chemicals, pesticides, disinfection by-products and cyanobacteria toxins. An assessment of the identified contaminants is conducted biannually in order to determine potential risks to customers.

Table 4 contains results of organic compounds that have been assessed in the Rand Water drinking water value chain. None of these compounds have been detected at levels that are a concern to human health. Monitoring of organic parameters is subject to an ongoing investigation as the measurement of these parameters is complex, and new emerging organic contaminants are being discovered often and limited analytical capacity is available in South Africa.

## **Department of Water and Sanitation**

### **Blue Drop System**

The Department of Water and Sanitation has established the Blue Drop System (BDS), which enables the department to monitor the performance of every Water Service Institution. All Water Services Institutions are required to register and upload information such as supply systems, laboratory used for analysis, water quality monitoring programmes, process controllers and data, to mention few, on a continuous basis. Rand Water's information is being updated on the system continuously as per the BDS requirements.

## **Retail Water Quality**

### **Consumer Complaints**

There were twenty two consumer complaints that required further technical investigation by Rand Water during the 2014-2015 reporting period. These complaints are summarised in the Table 5 below. The majority of the complaints were related to the water quality. All of the consumer complaints were successfully addressed and reported to the relevant local authorities. An increasing number of consumer complaints are being referred to the relevant local authority technical staff for further investigation, as the level of competence of staff in these authorities has improved over time. We are however, receiving more requests from the municipalities to assist with analyses that they are unable to do (invertebrates, organics and algae).

Consumer Complaints July 2014 - June 2015

