9.0

Conserving our Natural Resources

9.1 ENVIRONMENTAL SUSTAINABILITY, INCLUDING WATER RESOURCES ADEQUACY

Management Approach
Umgeni Water strives for sustainable growth and will ensure the organisation continues to provide and extend sustainable water services to all areas. Mindful of its high reliance on adequate supplies of raw water resources, energy, chemicals and other natural resources to undertake its core business services, Umgeni Water is committed to protecting, conserving, efficiently using and sustaining these resources.

Umgeni Water currently implements environmental management programmes and plans throughout the life-cycle of its projects, which is during planning, construction, operation and decommissioning. The different environmental management programmes and plans are categorised into:

- **Corporate environmental management** focusing on aligning the business activities towards environmental sustainability and promoting a shift towards the state of a green economy,
- **Operational environmental management** focusing on ensuring compliance of the organisation with applicable governing environmental legislation and regulations and avoiding and or minimising environmental impacts as a result of business activities, and
- **Integrated environmental management** focusing on the identification, mitigation and implementation of management plans for potential environmental impacts for infrastructure projects.

In addition to the mandatory disclosure requirements for a public water services entity in South Africa, Umgeni Water continues to improve alignment of its environmental indicators with the internationally accepted GRI – Global Reporting Initiative – indicator disclosure requirements, in terms of materiality and relevance. Aspects include: materials, including chemicals and water resources, energy efficiency, greenhouse gas emissions and carbon footprint mapping, biodiversity and waste management, amongst others.

**Water Resources Adequacy**
The core function of Umgeni Water, which is treatment and supply of bulk potable water, is highly dependent on the availability of sustainable water resources. The reconciliation between water resource availability and water demands...
Henley Dam an important water source in 1974

Safeguarding important water resources over the years

is therefore of primary importance to the organisation and forms an integral part of its infrastructure planning process. Understanding what water resources are available to the organisation both currently and in the future, and what impacts affect the level of assurance from these resources, is key to achieving the balance between supply and demand and in maintaining the assured level of supply required by customers. A map of water resources quality and quantity is shown in Figure 9.2.

Umgeni Water primarily sources water from ten impoundments on three major water resource systems namely, the Mgeni System (Mooi and Mgeni rivers), the North Coast System (Mdloti River) and the South Coast System (Nungwane, Mzimayi and Mzinto rivers). Total water withdrawal by source is shown in Table 9.1.

In the year, progress was made with the following water resources developments:

- Imvutshane Dam (UW) construction in progress,
- Spring Grove Dam (DWS-TCTA) impoundment in progress,
- uMkhomazi Water Project (DWS and UW) detailed feasibility study,
- Hazelmere Dam raising (DWS) detailed design,
- Lower Thukela Water Project (UW) construction of run of river abstraction in progress,
- Darvill WWTW Reuse project feasibility study,
- East Coast Desalination Plants detailed feasibility study, and
- Ludeke Dam (UW) construction completed.

Climate Change and Water Resources

The potential impact of a changing climate on the hydrology and water security of the four main supply dams in the Mgeni catchment has been assessed using 31 different future climate scenarios.

The assessment of different scenarios has resulted in a range of possible alternatives, each with an equal possibility of occurring in the future.
Potential Future Studies on Climate Change Impacts Assessment for Umgeni Water

With the recent developments in the modelling of potential climate change impacts on water resources systems in South Africa, Umgeni Water is considering studies that would improve the management of water resources and adaptive capacity to manage the potential impacts of a changing climate on water and infrastructure.

Some potential studies for consideration include:
- Using the Mgeni system to investigate the risk of potential impacts on future water supply using a more detailed and complex water resources system model,
- Investigate the potential for implementing flood operating rules for dams in the Mgeni system to reduce the risk associated with potential increased flooding under climate change,
- Investigate the potential impacts of increased flooding on regional floodlines,
- Investigate the potential impacts on key infrastructure such as dam safety,
- Investigate the potential impacts of increased sediment load on the operational and maintenance costs for key infrastructure, e.g. the Lower Thukela abstraction works.

Figure 9.2: Water resources and water quality

Water Resources Projects
1. Spring Grove Dam (DWS-TCTA) impoundment in progress,
2. Imvutoha Dam (UW) construction in progress,
3. Lower Thukela run of river abstraction construction in progress,
4. Hazelmere Dam raising (DWS) detailed design,
5. Darvill WWTW Reuse project feasibility study,
6. umkhomazi Water Project (DWS and UW) detailed feasibility study,
7. East Coast Desalination Plants detailed feasibility study (two potential sites).
Raw Water Quality

The status of raw water quality per supply source/catchment is presented in Table 9.1 and illustrated in Figure 9.2. Water quality risks that are currently associated with water resources are due to the presence of feedlots in some catchment areas, the presence of wastewater treatment works upstream of some impoundments, seasonal changes (rainfall/storm events, impoundment stratification) and sewer problems in some towns. These risks are inclusive of: Algal blooms and aquatic weed problems associated with eutrophication, chemical (including iron and manganese) contamination, elevated turbidity and faecal contamination (and associated pathogen risk) and erosion runoff contamination.

Umgeni Water has set resource quality objectives for abstractions for water treatment that it will continue to use as alert triggers for mitigation against increased public health risks and higher treatment costs. Water quality management plans include:

- Monitoring quality of raw water resources to assess source quality for treatment,
- Assessing risks associated with trends in eutrophication, chemical contaminants, pathogens and suspended solids, and effectiveness of raw water quality objectives,
- Engaging in catchment management activities to influence resource quality and quantity objectives that will balance environmental objectives whilst safeguarding consumer health, and
- Improving quality of waste discharges from its sites.

DWS is kept continuously apprised of the quality and risks associated with the source water trends to continue to ensure the long-term sustainability of South Africa’s water resources.

Table 9.1: Water Quality of Water Resource Dams and Abstractions

<table>
<thead>
<tr>
<th>System</th>
<th>River, Impoundment</th>
<th>Gross Capacity (million m³)</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mgeni</td>
<td>Mooi River, Mearns Weir</td>
<td>5.1</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Mgeni</td>
<td>Mooi River, Spring Grove Dam</td>
<td>139</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Good</td>
</tr>
<tr>
<td>Mgeni</td>
<td>Mgeni River, Midmar Dam</td>
<td>235</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>Mgeni</td>
<td>Mgeni River, Albert Falls Dam</td>
<td>290</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Mgeni</td>
<td>Mgeni River, Nagle Dam</td>
<td>25</td>
<td>Good</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Mgeni</td>
<td>Mgeni River, Inanda Dam</td>
<td>252</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>North Coast</td>
<td>Mdloti River, Hazelmere Dam</td>
<td>18</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
</tr>
<tr>
<td>North Coast</td>
<td>Mvoti River</td>
<td>7.3</td>
<td>N/A</td>
<td>N/A</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
</tr>
<tr>
<td>North Coast</td>
<td>Thukela River</td>
<td>110</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Unsatisfactory</td>
<td>Poor</td>
</tr>
<tr>
<td>North Coast</td>
<td>Imvutshane River</td>
<td>7</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Satisfactory</td>
<td>Good</td>
</tr>
<tr>
<td>South Coast</td>
<td>Mtwalume River</td>
<td>4.4</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
</tr>
<tr>
<td>South Coast</td>
<td>Mzumbe River, Mhlabatshane Dam</td>
<td>2.5</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Good</td>
</tr>
<tr>
<td>South Coast</td>
<td>iNungwane River, Nungwane Dam</td>
<td>2.2</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
</tr>
<tr>
<td>South Coast</td>
<td>Mzimayi River, E J Smith Dam</td>
<td>0.9</td>
<td>Unsatisfactory</td>
<td>Unsatisfactory</td>
<td>Unsatisfactory</td>
<td>Unsatisfactory</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>South Coast</td>
<td>Mzinto River, Mzinto Dam</td>
<td>0.4</td>
<td>Poor</td>
<td>Poor</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Good</td>
</tr>
<tr>
<td>Ixopo</td>
<td>Xhobo River Ixopo Dam</td>
<td>0.6</td>
<td>Satisfactory</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>
Conserving our Natural Resources

Water Loss Management
During the year, resources were used assiduously and water balancing and water loss management measures were instituted in the treatment systems. The total water loss level has been maintained below the target of 5% with 2.14% water loss incurred in 2014 (Figure 9.3).

<table>
<thead>
<tr>
<th>Location</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durban Heights</td>
<td>1.9%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Wiggins</td>
<td>2.0%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Mdlamnner</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>DV Harries</td>
<td>3.7%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Hazlenelle</td>
<td>5.5%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Amatantwini</td>
<td>3.8%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Mvoti</td>
<td>3.2%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Marimo</td>
<td>1.2%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Mqwilume</td>
<td>3.8%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Maphephethwa</td>
<td>3.3%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Hojo</td>
<td>6.6%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Overall</td>
<td>2.14%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Water Reuse
Umgeni Water is currently investigating the option of treating domestic sewage from its Darvill Wastewater Treatment Works to potable standards. The proposal would then be to return the treated water back into the distribution system at Umlaas Road. The water could then be used to augment the supply to the Western Aqueduct (due for completion mid 2018) which will serve the high growth areas along the western corridor of the eThekwini Metropolitan Municipality. The advantage of this is that water is made available higher up in the system. During the 2013/2014 review period, the feasibility study for this wastewater reclamation project was completed.

Materials Usage and Efficiency
Water is one of the most significant input materials for Umgeni Water and is covered in the previous section followed by energy which is discussed below. In addition, Umgeni Water has a high reliance on water treatment chemical resources and is therefore committed to improving the usage efficiency thereof.

Energy Usage and Efficiency
Energy is a key input to water and wastewater treatment processes, and in 2013/2014 Umgeni Water utilised a total of 237 million kWh of electricity. Figure 9.4 shows energy usage and efficiency. The increase from the previous year (2012/2013: 160 million kWh) can be attributed to significant elevated raw and potable water pumping in the year which is subject to optimal matching of storage levels with demands from the various systems.

Chemicals Usage and Efficiency
As part of the global eco-efficiency initiative, Umgeni Water measures, on a monthly basis, chemical usage at all its sites. The aim of this monitoring is to ensure optimal chemical usage and therefore support transformation towards sustainable development. The monitoring of water treatment chemical usage over time is mandatory as this is a major input into the process. Excessive chemical use not only leads to increased operational costs, but also to the unsustainable use of natural resources. Regular monitoring therefore provides an indication of the trend in chemical consumption per kilolitre of product produced (Figure 9.5).
Umgeni Water implements several initiatives to protect and conserve the natural environment and its resources. These include:

- Water treatment process audits, which identify areas to improve operational efficiency,
- Monitoring and reviewing seasonal variation of the water column / level in dams, to ensure optimal raw water quality is abstracted and treated,
- Participating in catchment management activities and forums, and contributing to the information base, including water quality, in order to shape and influence decisions for sustainable catchment land use activities and development, and
- Monthly chemical optimisation audits to ensure effective use of treatment chemicals and to facilitate prompt responses to problems identified through monthly sampling.

**Figure 9.5: Chemical Usage and Efficiency Trends**

![Chemical Usage and Efficiency Trends](image)

<table>
<thead>
<tr>
<th>Chemical usage in million kg per cubic metre of product</th>
<th>Chemical usage in million kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2011</td>
</tr>
<tr>
<td>0.0193</td>
<td>0.0209</td>
</tr>
</tbody>
</table>

**Carbon Footprint and Emissions Reduction Initiatives**

Umgeni Water’s direct CO₂ emissions arise from fuel usage for transport (vehicles), general waste and from generators and boats, while indirect CO₂ emissions are primarily due to electricity usage, and to a minor extent flights.

The organisation’s carbon footprint is primarily due to electricity consumption, and has accordingly been increasing over the years (refer to **Figure 9.6** and **Table 9.2**)

![CO₂ Equivalents (tonnes)](image)

**Table 9.2: CO₂ Equivalents (tonnes)**

<table>
<thead>
<tr>
<th>CO₂ equivalents (tonnes) per activity</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>163392</td>
<td>208071</td>
<td>153280</td>
<td>234575</td>
</tr>
<tr>
<td>Travel: Car</td>
<td>1334</td>
<td>2086</td>
<td>137</td>
<td>1035</td>
</tr>
<tr>
<td>Travel: Air</td>
<td>143</td>
<td>81</td>
<td>71</td>
<td>87</td>
</tr>
<tr>
<td>Waste</td>
<td>299</td>
<td>262</td>
<td>196</td>
<td>305</td>
</tr>
<tr>
<td>Other fuel</td>
<td>40</td>
<td>98</td>
<td>82</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>165064</td>
<td>210598</td>
<td>153766</td>
<td>236044</td>
</tr>
</tbody>
</table>

**Biodiversity Management**

The management of biodiversity at Umgeni Water over the past year has included:

- The monitoring and eradication of alien aquatic vegetation,
- Support for the Working-for-Water programme in the eradication of land based alien vegetation,
- Specialist rehabilitation of sites after the completion of construction programmes,
- Ensuring biodiversity impact assessment is considered in infrastructure development, and
- Carrying out bio-monitoring downstream of major infrastructure.
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**Alien Plant Management**

The invasion of alien aquatic weeds remains a threat to water resources and biodiversity within KwaZulu-Natal. The invading species pose a major risk to both water quality and quantity in a number of impoundments managed or owned by the utility. On-going control is vital to maintaining weed free dams and this control is achieved through the use of bio-control, manual removal, including Working-for-Water (WfW), and the application of herbicides.

The water resources areas with significant water weed threats include:

- **Albert Falls Dam. Water Lettuce (Pistia stratiotes).** The preferred method of control implemented at this dam is bio-control and during the review period this method remained effective for control of the spread of the plant in the dam.

- **Inanda Dam - Msunduzi-Mgeni river system.** The weed problem within the river system remained problematic during the year with infestation of Water Hyacinth (*Eichhornia crassipes*) exacerbated by the high nutrient load to the system and numerous heavy rainfall events leading to an increase in the influx of the weed at the inflow to Inanda dam. Several interventions were implemented by Duzi Umgeni Conservation Trust (DUCT), WfW and Umgeni Water in the year to bring the infestation under control and manage its influx to the dam.

- **Pietermaritzburg area (Msundzi River).** Water Lettuce, (*Pistia molestata*) remains the most predominant alien invasive species in this system. During this period there have been isolated pockets of plants colonising the riparian vegetation along the river. Control in this area has been achieved through interventions by DUCT and the strong presence of the bio control.

- **Ixopo Dam.** Both Water Hyacinth and Kariba weed are present in this system. The infestation of Kariba weed (*Salvinia molesta*) has been limited due to the presence of bio control. Water Hyacinth is being partially controlled by the bio control and the cold weather. However, the plants tend to persist in the riparian vegetation (*Limpopo grass*) which offers the weed protection from cold.

**SASS monitoring of river systems by Umgeni Water**

The South African Scoring System 5 (SASS 5) hydro-biological assessment tool was used to assess the river health above and below the dams managed by Umgeni Water to assess the impact of impoundment on the water resources. Twenty-five (25) samples upstream and downstream of the eight (8) dams monitored, were successfully taken and analysed. In most cases, despite the minor differences between the downstream and upstream points, downstream river health was maintained. In one case, the Mzinto dam, the river health below the dam was vastly better than upstream due to urban development impacting the upstream system.

**Msinsi Holdings Land and Sustainable Resource Management**

Msinsi Holdings SOC Ltd, a wholly-owned subsidiary of Umgeni Water is mandated to manage the land and biodiversity of the areas around the dams owned or managed by Umgeni Water in a manner that balances the divergent factors of local community development, provision of recreational facilities for the public and water resources/biodiversity protection.

These reserves are located at:
- Spring Grove Dam,
- Albert Falls Dam,
- Nagle Dam,
- Inanda Dam and
- Hazelmere Dam.

Detailed management plans for each of the reserves, in line with industry best practice, have been completed and form the basis for all operations in the reserves. In the past year, Msinsi has been successful in protecting the habitats and ensuring an ecological sustainable and protected water environment through implementing its resource management plans, which focused on:
- The management of the game and species according to the carrying capacity of each reserve,
- Local community development,
- Recreation for the public,
- Grassland management,
- Control of pollution inside the purchase areas, and
- Removal of alien invasive plants, both terrestrial and aquatic.

Msinsi Holdings continues to be seen as a significant player in the conservation and tourism sector in KZN. The close proximity of the Reserves managed by Msinsi Holdings to the urban centres of Durban and Pietermaritzburg make these little pockets of biodiversity invaluable. Msinsi Holdings will continue to ensure that the ecosystem services provided by the resources it manages on behalf of Umgeni Water are sustainably managed.

**Waste Management**

Umgeni Water continues to track waste generated and recycled from all operational sites. Volumes of general and hazardous waste generated are shown in Figure 9.7.

Going forward systems to improve capture of waste data need to be put in place.

**Figure 9.7: Waste Produced**

![Waste Produced Chart](chart.png)
The percentage of total waste recycled is shown in Figure 9.8 and has declined since the previous period.

In compliance with regulations promulgated in the last year under the National Environmental Management Waste Act (NEMWA 58 of 2008), all water treatment residues were classified through an independent consultant and laboratory.

Of concern is the classification of water treatment residues at several of the Umgeni Water plants as hazardous waste due to the stringent chemical standards for classification. A feasibility study to address the development of a new disposal site in the coastal system for the disposal of water treatment residues will be undertaken in the coming year.

**Figure 9.8: Per Cent Waste Recycled**

![Bar chart showing percentage of waste recycled from 2011 to 2014: 0.13%, 0.20%, 0.44%, 0.16%]

**Environmental performance of the Operational sites**

The organisation continues to improve environmental performance at all operational sites through conducting annual environmental audits with the aim to:

- Assess whether the site is complying with all applicable environmental regulations and legislation;
- Assess internal policy and procedural compliance in relation to environmental management;
- Assess the status of energy, waste and biodiversity management at the site, and
- Recommend mitigation measures to address identified non-conformances to aid in improvement.

For the 2013/2014 reporting period, twenty-eight (28) operational sites were audited for environmental compliance. These included water treatment works, wastewater treatment works, dams, workshops and regional offices. The identified non-conformances are shown in Figure 9.9.

Measures to improve waste management are required at over 30% of the operational sites audited, including proper handling, separation and site storage.
Conserving our Natural Resources

**Figure 9.9: Environmental Audit Findings**

- Waste Management: 9
- Alien plant management: 2
- Housekeeping: 2
- Chemical spills: 1
- Discharge permit compliance: 1
- Soil erosion: 1
- Water leaks: 1

Number of sites with findings

**Environmental incidences**

Incident management systems are in place to ensure proper and timeous response to incidents. The number of environmental incidents, **Figure 9.10**, increased from the prior period.

The most common incidents were chemical spillages (ammonia, poly and chlorine leak) and spilling of backwash recovery tanks contents into a water course. Measures were implemented in the reporting period to correct and prevent the recurrence of similar incidents.

**Integrated Environmental Management**

Eleven (11) projects, currently in planning, design or procurement phases are being managed through the Integrated Environmental Management system.

In compliance with the provisions of the Environmental Impact Assessment (EIA) regulations of the National environmental Management Act, some projects required a basic assessment or a scoping and full environmental impact assessment study to be conducted.

In addition, for project developments that are not listed activities as promulgated by the National Environmental Management Act, the entity still undertakes environmental screening and develops an internal project specific Environmental Management Plan to address any potential environmental impacts and mitigation measures for implementation thereby complying with its commitment towards excellent environmental management practise.

For the reporting period, there were no fines issued by the authority with regards to contravention of environmental legal requirements and the organisation will still strive to maintain a close working relationship with the National and Provincial environmental management authorities and rely on their guidance. **Table 9.3** shows environmental authorisations for key bulk infrastructure projects obtained and those still in progress for the period under review.

**Figure 9.10: Environmental Incidents**
Table 9.3: Status of Bulk Infrastructure Projects Environmental Authorisation (EA) in 2013/2014.

<table>
<thead>
<tr>
<th>Project name</th>
<th>EA status requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Coast Desalination</td>
<td>EA application in progress</td>
</tr>
<tr>
<td>Greater Mpofana Regional Scheme</td>
<td>Amend existing EA</td>
</tr>
<tr>
<td>Lower Thukela BWSS</td>
<td>EIA Obtained</td>
</tr>
<tr>
<td>Midmar WTW, Sludge Plant and Raw Water Pipeline Upgrade</td>
<td>EIA Obtained</td>
</tr>
<tr>
<td>Nungwane Raw Water Aqueducts</td>
<td>EIA application in progress</td>
</tr>
<tr>
<td>Ngcebo WTW Upgrade</td>
<td>EIA application in progress</td>
</tr>
<tr>
<td>Darvill Wastewater Treatment Works Upgrade</td>
<td>EIA Obtained</td>
</tr>
<tr>
<td>uMshwathi BWSS</td>
<td>EIA application in progress</td>
</tr>
</tbody>
</table>

Seventeen (17) projects are currently in construction phase and these projects are monitored for compliance against their individual Environmental Management Plans, conditions of the Environmental Authorisations, contractual obligations and international best practises. These monitoring interventions are conducted by independent external Environmental Control Officers, internal Environmental Site Officers and Environmental Scientists. During the 2013/2014 period, two penalties, related to inadequate provision of sanitation facilities and solid waste receptacles, were issued to the contractor due to failure to comply with some of the conditions of the internal project specific Environmental Management Plan.

Overall environmental performance has been satisfactory with minor challenges in various phases of the project life-cycle:
- Delays in obtaining environmental authorisation from the relevant environmental authorities,
- Hydrocarbon (diesel and oil) spillages during construction activities,
- Storing of bedding material outside the construction zone working servitude, and
- Encroachment of alien weeds on the stockpiled excavated top soil material.

Monitoring and evaluation throughout the life cycle of water projects, enables Umgeni Water to identify, address and put in place controls to reduce its environmental impacts.