ANNUAL WATER QUALITY STATUS REPORT FOR THE INKOMATI-USUTHU WATER MANAGEMENT AREA

2014/15 financial year

EXECUTIVE SUMMARY

Overview of the Inkomati-Usuthu Water Management Area

The Inkomati Catchment Management Agency (ICMA) is the responsible authority within the jurisdiction of the Inkomati Water Management Area, which has now been extended to include the Usuthu Catchment. This has also been accompanied by the name change to the Inkomati-Usuthu Catchment Management Agency (IUCMA). The Inkomati-Usuthu Water Management Area is depicted in a reddish-orange colour in Figure 1 (DWA, 2013) below, and is one of the nine newly demarcated Water Management Areas (WMAs). It is located in the eastern part of South Africa and falls wholly within the Mpumalanga Provincial boundaries.

The Inkomati-Usuthu WMA is part of an international basin called the Incomati basin. The water resources in the area are strategically important for international obligations as well as inter-basin transfers for power generation. As an authority, the IUCMA is responsible for managing, controlling, protecting and monitoring water resources in its area of responsibility.

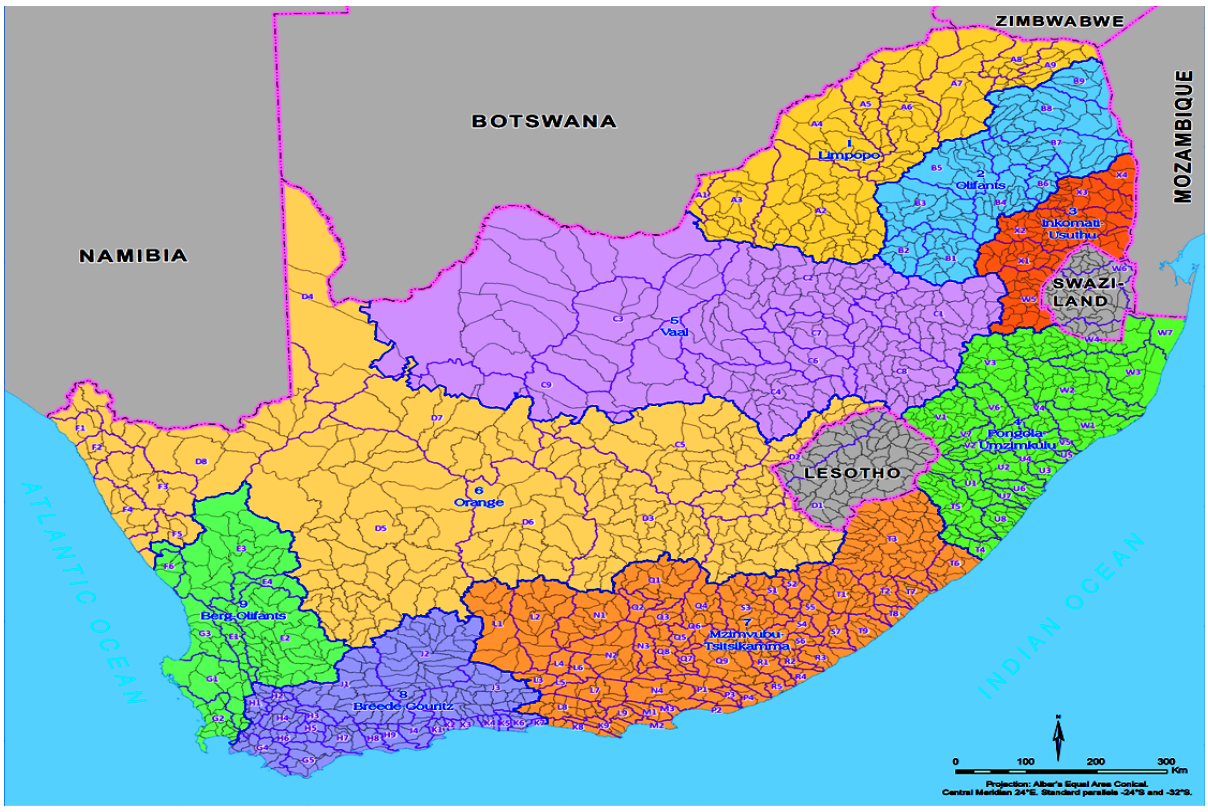


Figure 1: Map of the newly demarcated Water Management Areas of South Africa

Purpose of the Report

The purpose of this report is to share information on the water quality status in the catchment, attribute some of the impact to specific activities within the catchment, indicate the steps that the organisation is taking towards remedying the impacts as well as show the status of authorisation of various water use activities within the water management area. The River Health Monitoring Reports for the Sabie and Crocodile Rivers were produced in 2013 and 2014 respectively. This report will focus only on the chemical and microbial water quality and covers the Sabie-Sand, Crocodile, Komati and Usuthu Catchments.

Water Quality Monitoring

Chemical water quality monitoring is performed on a monthly basis through grab sampling, and the samples are submitted to an independent, accredited laboratory for analysis. The variables of concern differ from catchment to catchment and are based on the types of activities occurring within a specific catchment. Monitoring is conducted both in-stream to determine the quality of water as well as at the discharge point to establish the quality of the discharge and its compliance with licence conditions or discharge standards. Often the monitoring of the discharge is accompanied by in-stream monitoring upstream and downstream of the discharge to determine the impact of the discharge. It is also critically important to monitor the background water quality at the headwaters as well as the quality of the most downstream point before the river exits or flows into a neighbouring country.

For the purpose of this report, strategic monitoring points were selected only instream to report on the water quality status since it would not have been practical to report on all monitoring sites. These included the headwaters, the exit point of the catchment and a few strategic points in the main stem as well as the discharge of the tributaries into the main stem. The information presented covers a period of approximately two years from January 2013 until March 2015, presented in time series. It is envisaged that the report will in future look at longer-term trends rather than just two years. This should be possible once the IUCMA has access to the Water Management System of the Department of Water and Sanitation where water quality data is captured. Three indicator variables were selected and these were:

pH - The pH of water indicates the acidity or basicity of the water. pH can range from 0 to 14. A pH of 7 is neutral. A measurement above 7 is basic. A measurement below 7 is acidic.

Electrical Conductivity (EC) - Electrical Conductivity (EC) measures water's ability to conduct an electric current. It is directly related to the concentration of salts dissolved in water.

Escherichia coli (*E. coli*) - *E. coli* is an indicator of faecal contamination of humans or other animals in the water resource. Faecal coliform bacteria can enter rivers through direct discharge of waste from mammals and other animals, from agricultural and storm runoff (non-point sources) and from human sewage.

The compliance of these indicator parameters was compared with the Target Water Quality Guideline limits (TWQG) for the Sabie, Komati and Usuthu Catchments and the Interim Water Quality Objectives (IWQO) for the Crocodile Catchment. This is because the Crocodile Catchment has IWQO while the other three catchments do not have them. This situation will also change in future when the Resource Quality Objectives (RQOs) are promulgated as part of the classification process.

It will be borne in mind that once promulgated, all institutions of government and water users must give effect to the class of the resource as well as the associated reserves and RQOs.

Water Quality Status

The chemical water quality is fairly good except at a few sites in the Komati Catchment. The microbiological quality is serious cause for concern in all four catchments. The numbers of *E. coli* counts are extremely high. This observation has influenced the Resource Protection and Waste division to profile all Wastewater Treatment Works (WWTW) in the WMA to determine their status in respect of authorisation, design and operational capacities, classification of process controllers, and so on.

It is envisaged that the profiling of WWTW will give the division a better understanding of the challenges they are facing and how to approach them. It is also envisaged that the report will shed some light on the impact of these facilities on water resources and focus some of the attention of the owners of these facilities on their state of disrepair and the damage they are causing to the environment.

The IUCMA also started participating in the MUSSA (Municipal Strategic Self-Assessment) conducted by the Department of Water and Sanitation providing detailed information which present the basis for discussion and engagement with municipalities and the Department. This is an ongoing process which emanated from the water quality workshop that was hosted by the IUCMA focussing only on impacts of municipal waste water treatment works (WWTW) within the Crocodile Catchment.

One of the spin-offs that came out of this initiative is the involvement of the Provincial Department of Co-operative Government and Traditional Affairs (CoGTA) which has did not only emphasise the water quality impacts of municipal wwtw, but also brought sharp focus on the issues associated with the performance of wwtw within the water management area but also covering the whole province. The Department of CoGTA is reported to be interested in assessing municipal infrastructure with a view to implement intervention measures where necessary in order to enhance the performance of municipal wwtw in the Mpumalanga Province. In other words, the proto-CMAs of both the Upper Vaal and the Olifants Water Management Areas will also benefit from this initiative of the IUCMA since the Mpumalanga Province extends beyond the boundaries of the Inkomati-Usuthu Water Management Area.

Table of Contents

CHAPTER 1: THE SABIE RIVER CATCHMENT

1.1 Introduction

The Sabie River originates in the upper reaches of the town of Sabie, and passes through Sabie where entities such as York Timber Sawmill and the now-defunct underground gold mines of the Transvaal Gold Mine Estate (TGME) are situated. The Sabie River flows further through Hazyview and Mkhuhlu and other residential areas before it enters the Kruger National Park (KNP), Mozambique and the Indian Ocean respectively. The main tributaries of the Sabie River are the Mac-Mac River, Klein Sabie River, Noord-Sand River, Bega River, Sand River and Mutlumuvi River. The Sand River flows into the Sabie River inside the Kruger National Park. There are five main dams in the Sabie Sand Catchment, namely Inyaka Dam, Da-Gama Dam, Eidenburg Dam, Mahleve Dam and Swartfontein Dam.

This report focuses on the water quality status of the tributaries and selected points along the main stem of the Sabie River. The Sabie Sand Catchment consists of Thaba Chweu, Bushbuckridge and Mbombela Local Municipalities. These municipalities have Wastewater Treatment Works (WWTW) that discharge wastewater into the Sabie River and some of its tributaries.

The catchment is dominated by trout farming, forestry at the upper reaches of the catchment and different forms of housing development including guest houses, lodges and hotels. According to the findings from the Ecostatus of the Sabie Sand River Catchment dated October 2012, compiled by the Mpumalanga Tourism and Parks Agency (MTPA), the town of Sabie has a negative effect on the health of the river (resource) due to unsustainable urban development and pollution from factories and sawmills. The WWTW are poorly maintained, and trout farming has impacted negatively on the biodiversity of the Inyaka Dam and the river itself.

The middle reaches from Hazyview to the Kruger National Park are affected mostly by agriculture, eco-adventure tourism, irrigation, water abstraction and urban development. The lower reaches of the catchment are inside the Kruger National Park which is a protected area.

Figures 2 and 3 below show the map of the Sabie Catchment with strategic motoring points depicted and schematic representation of the catchment respectively.

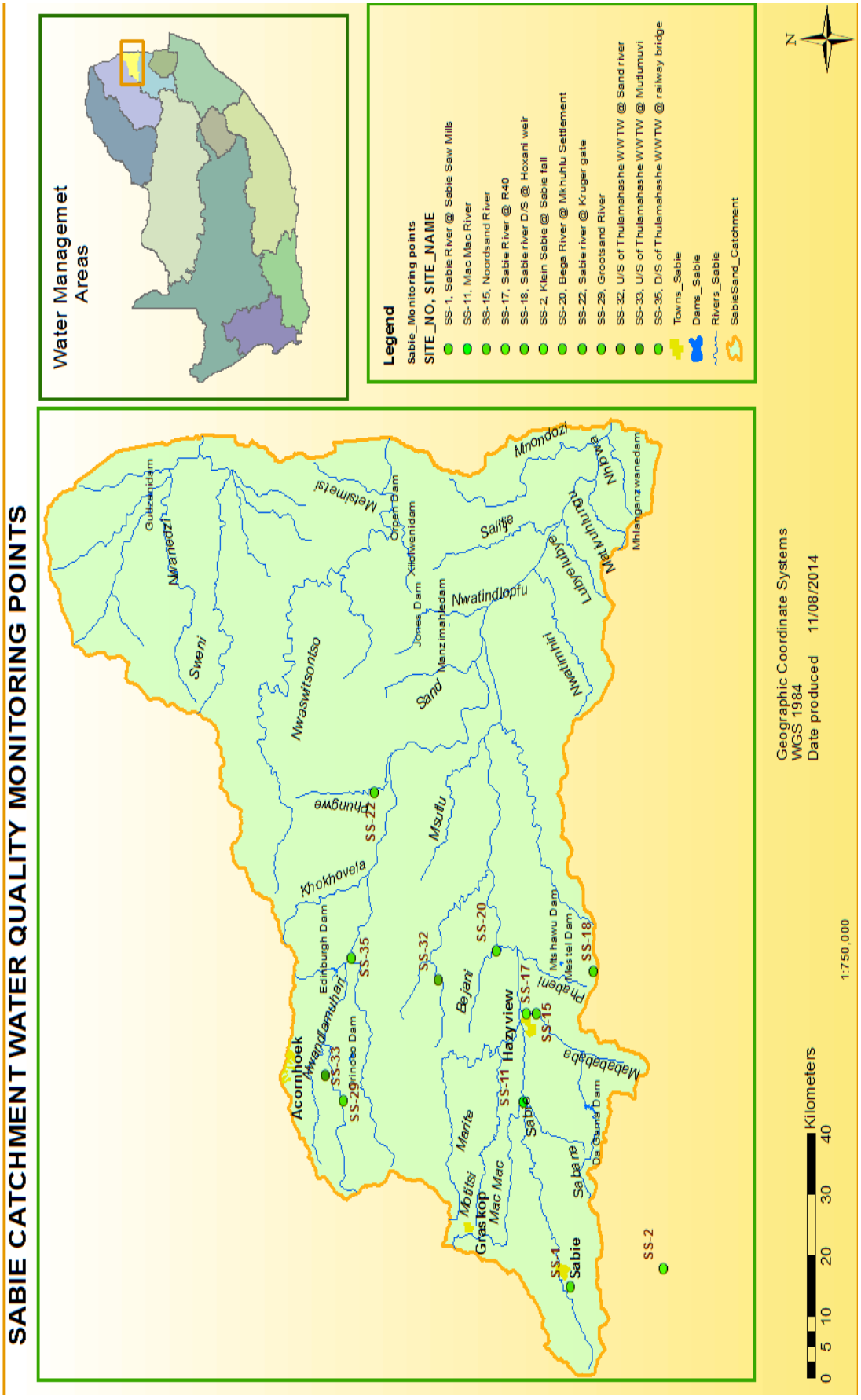


Figure 2: Map of the Sabie Sand Catchment showing selected monitoring points

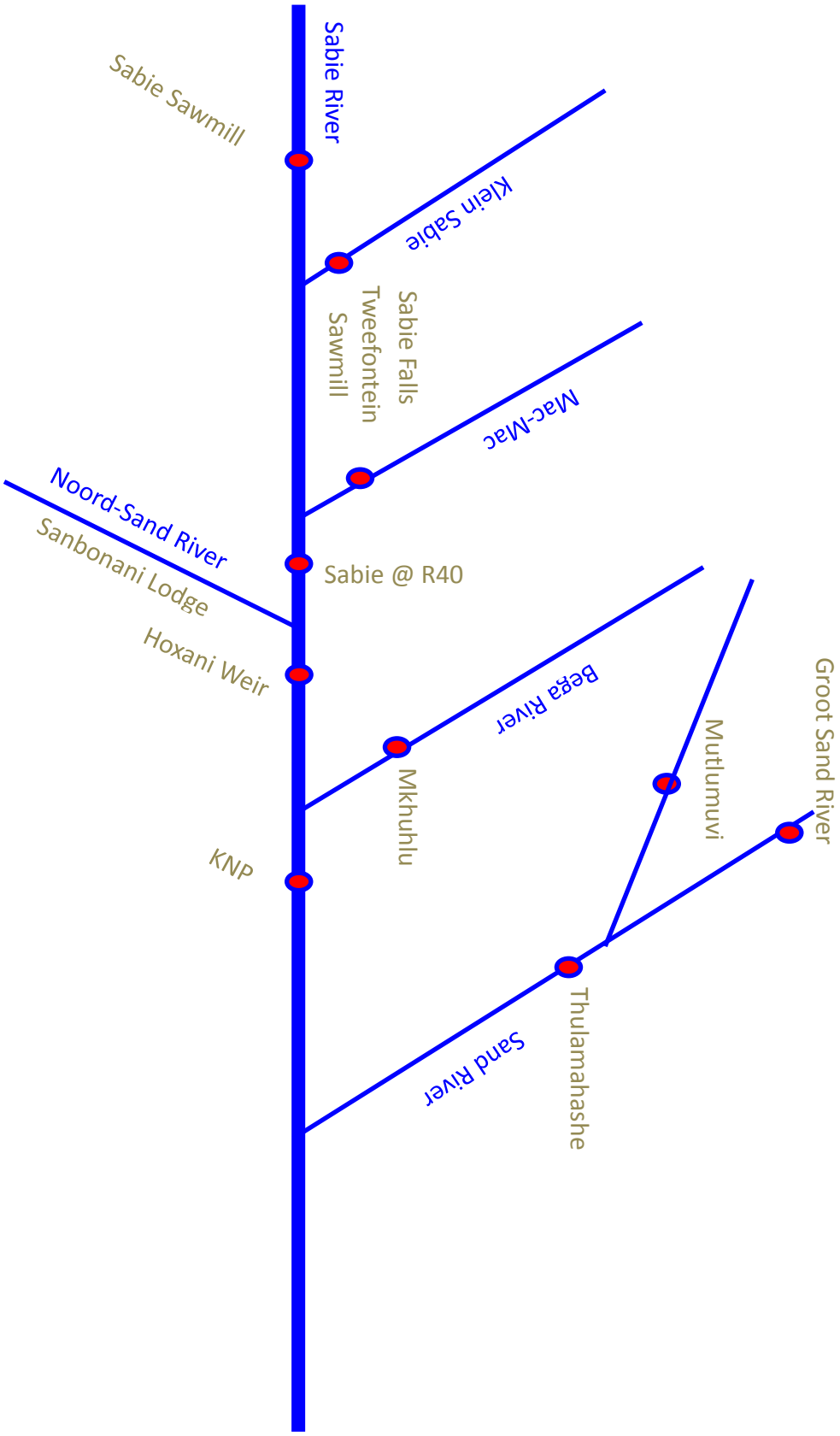


Figure 3: Diagrammatic representation of the Sabie Sand Catchment showing selected monitoring sites

A total of 12 monitoring points were selected in the Sabie River and its tributaries. Four monitoring points were selected in the main stem of the Sabie River from the headwaters until the river enters the Kruger National Park. The remaining eight monitoring points show the quality of water contributed by the tributaries into the main stem of the Sabie as well as the head waters of the Groot Sand River. Table 1 shows the location details of selected monitoring points.

Table 1: List of monitoring points indicating the site name, location and co-ordinates of the Sabie Sand River Catchment

SITE NO.	SITE NAME	RIVER	CO-ORDINATES	
			LAT (S)	**LONG (E)**
SS - 1	Sabie River @ Sabie Sawmill	Sabie River	25° 06' 06.83" S	30° 45' 05.34" E
SS - 2	Klein Sabie @ Sabie Falls	Klein Sabie	25°05' 16.95" S	30° 46' 42.22" E
SS - 11	Mac-Mac River	Mac-Mac River	25° 01' 46.10" S	31° 01' 32.12" E
SS - 17	Sabie River @ R40	Sabie River	25° 01' 49.88" S	31° 07' 30.64" E
SS - 15	Noord-Sand River	Noord-Sand River	25° 02' 03.21" S	31° 09' 18.24" E
SS - 18	Sabie River D/S @ Hoxani Weir	Sabie River	25° 01' 09.40" S	31° 13' 06.70" E
SS - 20	Bega River @ Mkhuhlu Settlement	Bega River	24° 58' 59.77" S	31° 14' 51.34" E
SS - 22	Sabie River @ Kruger Gate	Sabie River	24° 58' 46.57" S	31° 28' 57.23" E
SS - 29	Groot Sand River	Sand River	24° 42' 27.13" S	31° 01' 37.12" E
SS - 32	U/S of Thulamahashe WWTW @ Sand River	Sand River	24° 42' 53.47" S	31° 12' 18.66" E
SS - 33	U/S of Thulamahashe WWTW @ Mutlumuvi	Mutlumuvi River	24° 43' 41.02" S	31° 03' 49.81" E
SS - 35	D/S of Thulamahashe WWTW @ Railway bridge	Sand River	24° 43' 18.17" S	31° 14' 13.71" E

1.2 Water Quality Status

The samples were analysed by a SANAS-accredited laboratory. Since the Sabie River does not have Interim Water Quality Objectives, the Target Water Quality Guidelines were used for comparison purposes to determine compliance with the most stringent objectives that protect the fitness for use for the most sensitive user. Table 2 below shows the target water quality guidelines for relevant variables of concern. As indicated elsewhere in this document, indicator variables were selected for the purposes of this report to demonstrate the status of water quality in the Sabie Sand Catchment.

Table 2: Target Water Quality Guidelines for relevant variables of concern for the Sabie Sand Catchment

Variable	Target Water Quality Guidelines	Uniform Effluent Standards	
		General	Special
pH (pH Units)	6.5 - 8.5	5.5-9.5	5.5-7.5
Conductivity (mS/m	0-40	intake+75%; 250	intake+15%; 250
E. coli (CFU/100 ml)	0	0	0
Ammonia (mg/l)	0-1.0	10	1.0
Chemical Oxygen Demand (COD)	0-10	75	30
Nitrate & Nitrite (mg/l)	0-6		1.5
Soluble Ortho-Phosphate (mg/l)	0.005-0.025		1.0
Suspended Solids	0-5	25	10

1.2.1 Water quality status of the Sabie River

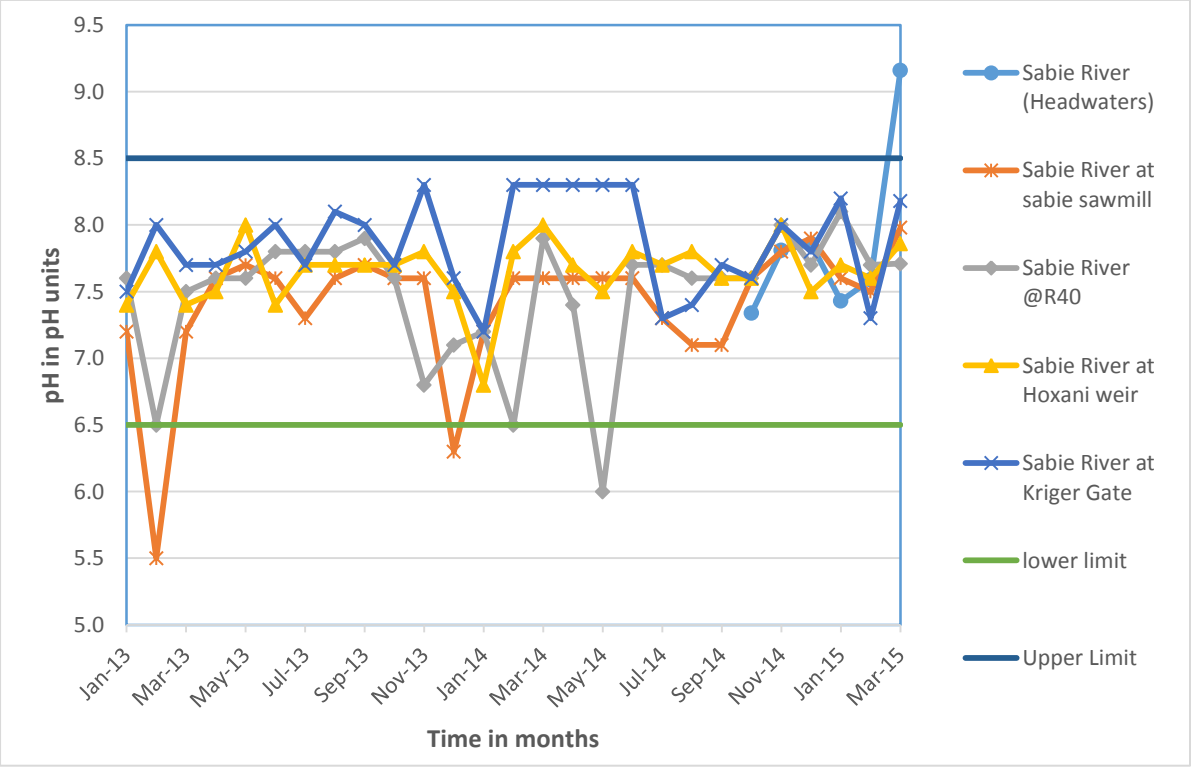


Figure 4: pH levels measured in the main stem of the Sabie River.

The pH in most of the monitoring points are within the acceptable limit, accept four points outside of the acceptable range as depicted in figure 4 above. These outliers could not be attributed to any activity or geology in the area and is therefore attributed to human error.

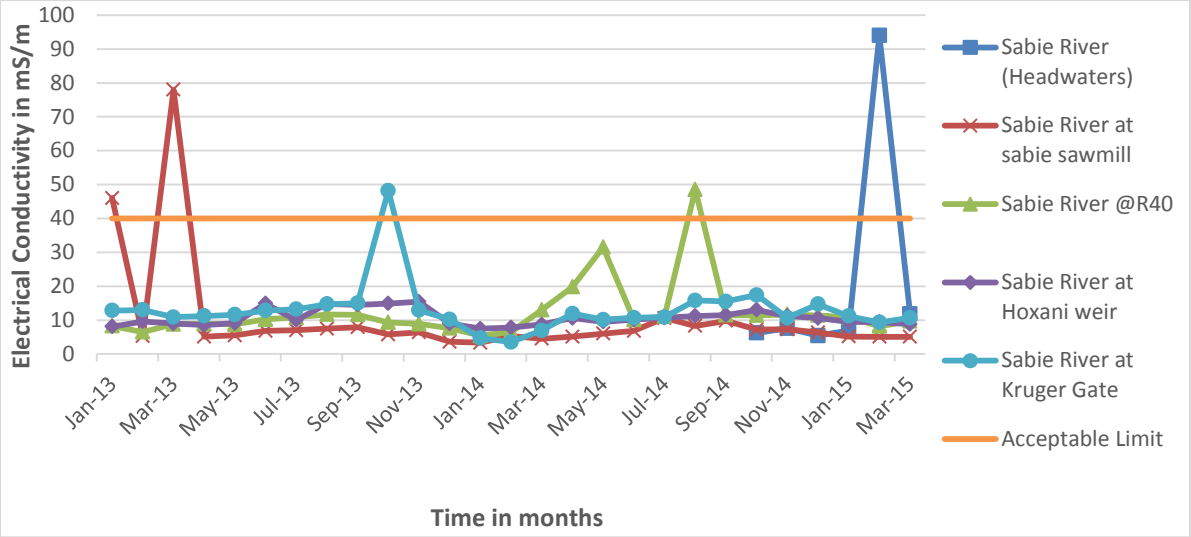


Figure 5: Electrical Conductivity measured in the main stem of the Sabie River

Figure 5 shows that the quality of water at the most upstream monitoring point is impacted more severely compared to the rest of the river going downstream. This can be attributed to activities such as trout farming and saw milling taking place upstream of such monitoring. The quality of water improves slightly from the headwaters as a result of the dilution from the tributaries and then deteriorates slightly as the river proceeds downstream towards the Kruger National Park and Mozambique. It must, however, be mentioned that the Electrical Conductivity is still far lower (much better) than the acceptable TWQG of 40 mS/m.

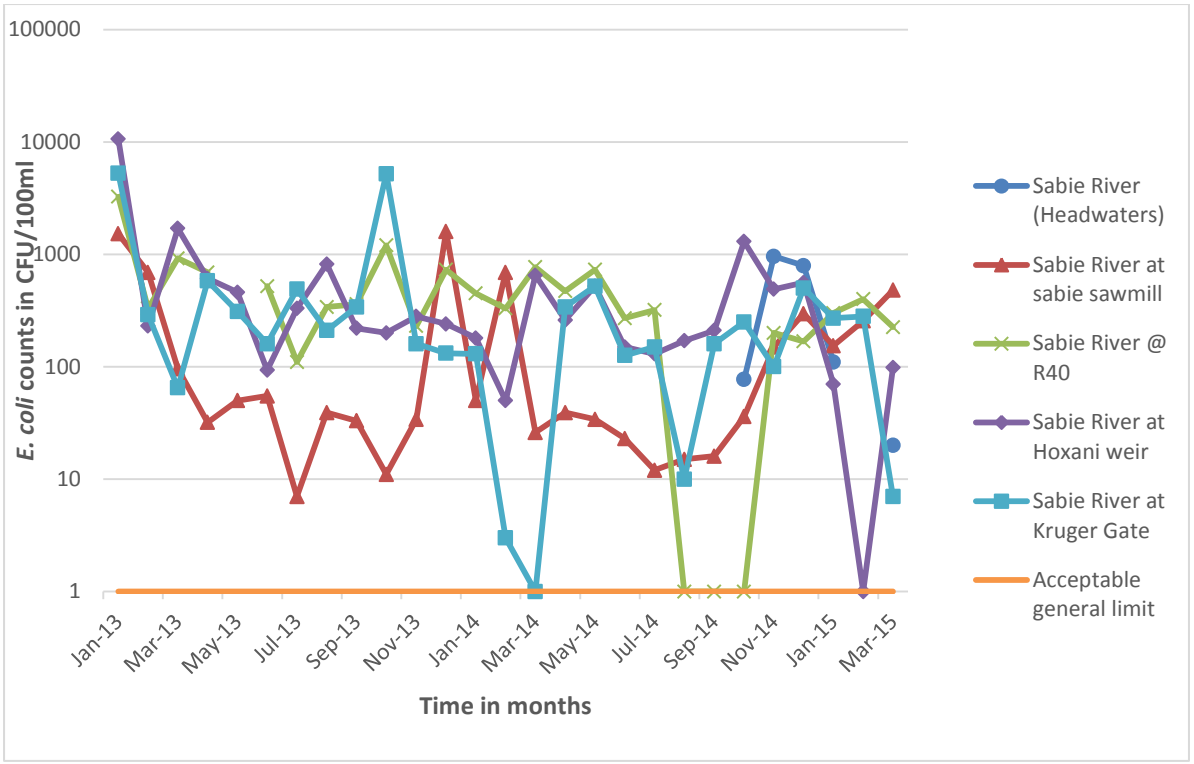


Figure 6: *E. coli* counts measured in counts per 100 ml in the main stem of the Sabie River

The microbial quality of water in the Sabie River is heavily impacted/degraded and significantly above the tolerable levels. The quality in the headwaters shows average *E. coli* counts of approximately 100 counts/100 ml and deteriorates further as the river flows towards the Kruger National Park. This is attributed to the impacts of various WWTW for both Thaba Chweu and Bushbuckridge Municipalities as well as overflows from manholes and non-functional pump stations (figure 6). It must be mentioned that the monitoring point for the headwaters of the Sabie River is not a historical point and that it was commissioned only recently to monitor the background water quality from the origin of the river. Hence the graph for this point is shorter.

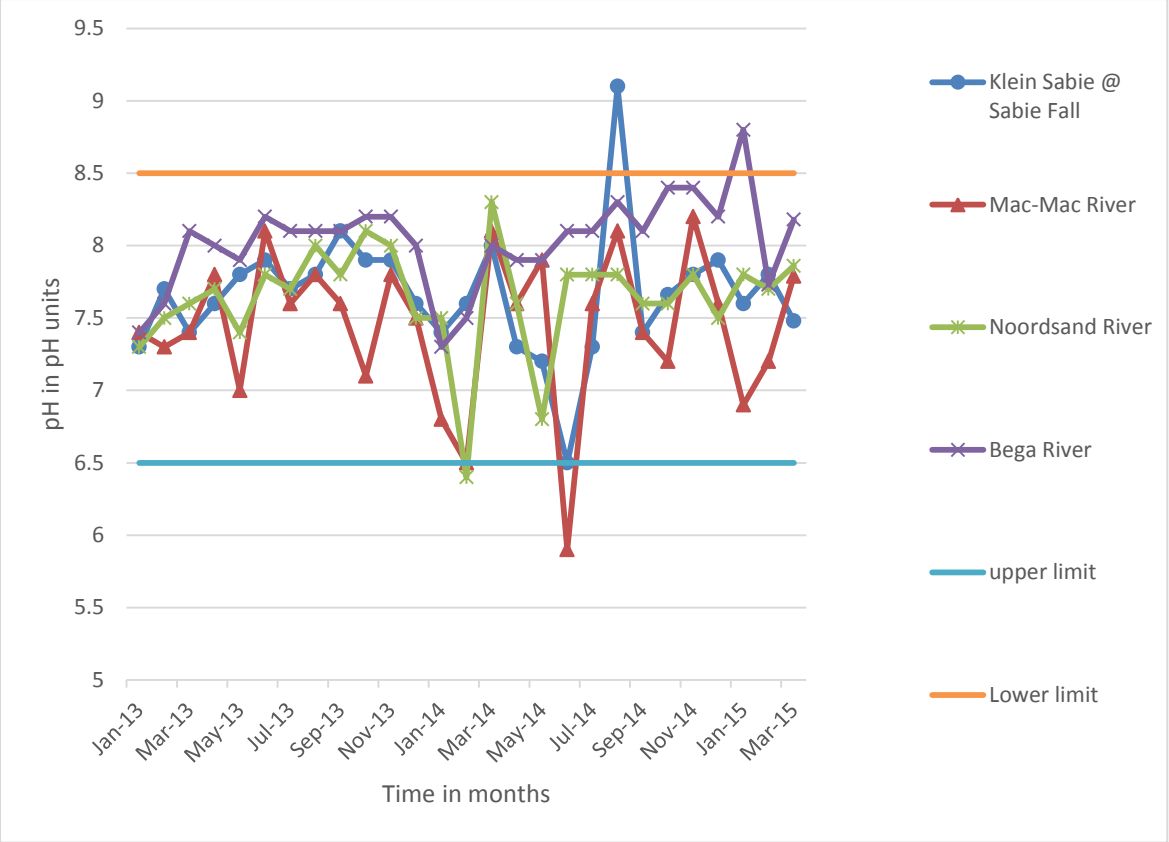


Figure 7: pH levels measured in the tributaries of Sabie River

The pH of water in the tributaries of the Sabie River is acceptable as it is neither alkaline nor acidic. The pH of most of the selected sites ranges between 7.5 and 7.9 (figure 7). PH is therefore not a problematic variable in the Sabie Catchment.

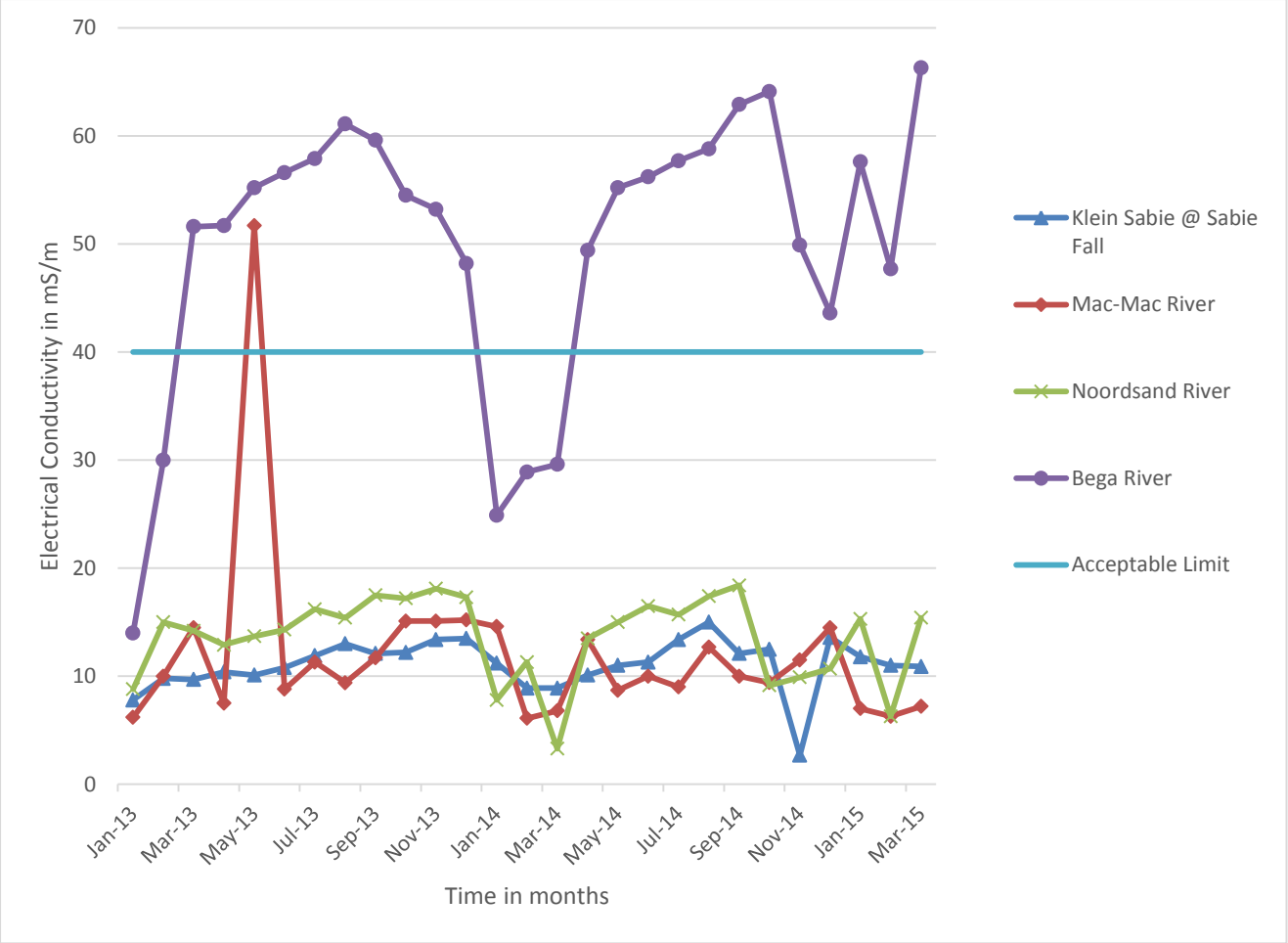


Figure 8: Electrical Conductivity measured in the tributaries of Sabie River

The chemical quality of water in the various tributaries of the Sabie River is good. The trends for this tributaries show seasonality and fluctuation that indicates higher salt concentrations during dry seasons and low salt concentrations (dilution) during the wet or rainy seasons. As indicated in figure 8 above, the levels of dissolved salts, as indicated by measuring Electrical Conductivity (EC) over the reporting period showed that three tributaries complied with the TWQG of 40 mS/m, while one tributary (the Bega River) exceeded the TWQG. The Bega River flows through the Mkhuhlu Township. The slight deterioration in the chemical water quality of this stream is attributed to overflows from blocked manholes (sewer line) and illegal dumping of other domestic solid waste material inside the river.

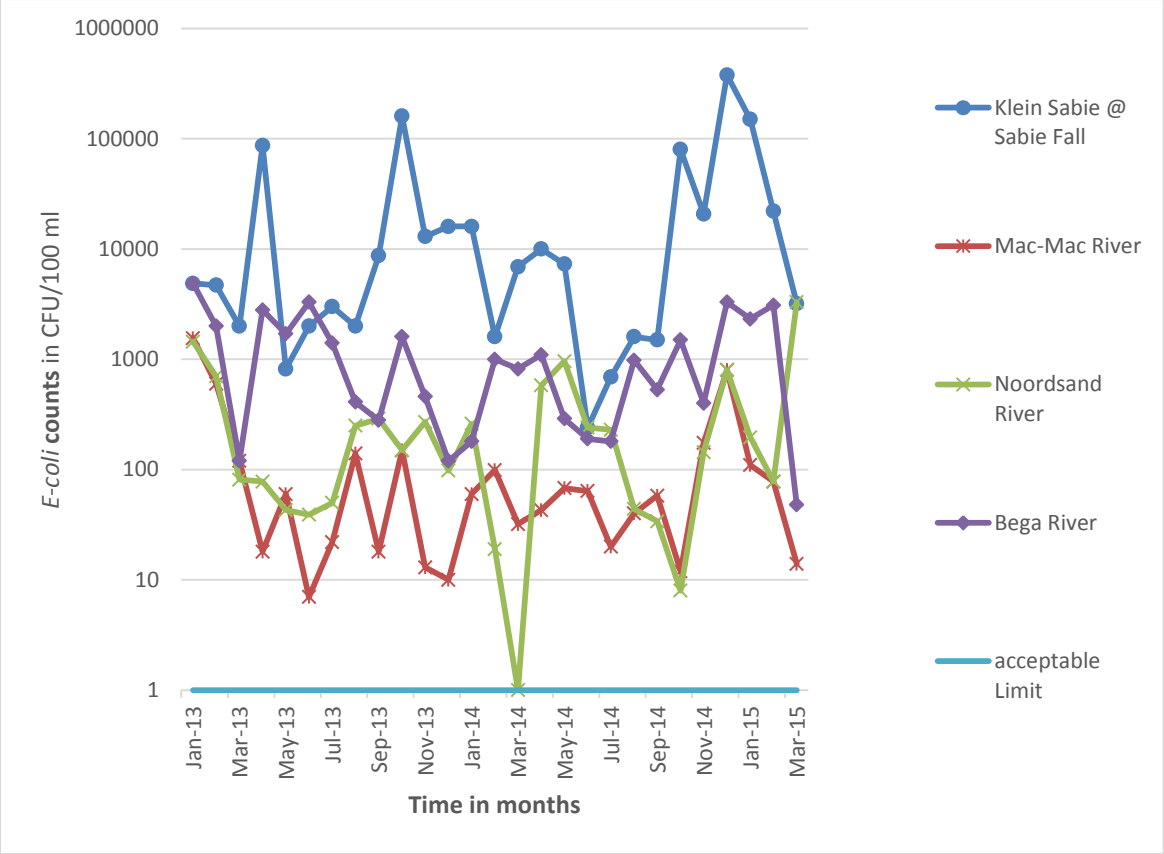


Figure 9: *E. coli* measured in counts per 100 ml in the tributaries of Sabie River

Figure 9 above shows that all the tributaries did not comply with the TWQG. Investigations conducted by the IUCMA have shown that the high *E. coli* counts are ascribed to blocked manholes which cause raw sewage to overflow and illegal dumping of domestic solid waste material into the water resources. The Klein Sabie River passes through a settlement in the town of Sabie, the Noordsand passes through the town of Hazyview while the Bega River flows through the Mkhuhlu Township. In all cases, the high *E. coli* counts are attributed to the overflows from manholes, illegal dumping of solid waste material, burst sewage reticulation pipelines as well as non-functional pump stations.

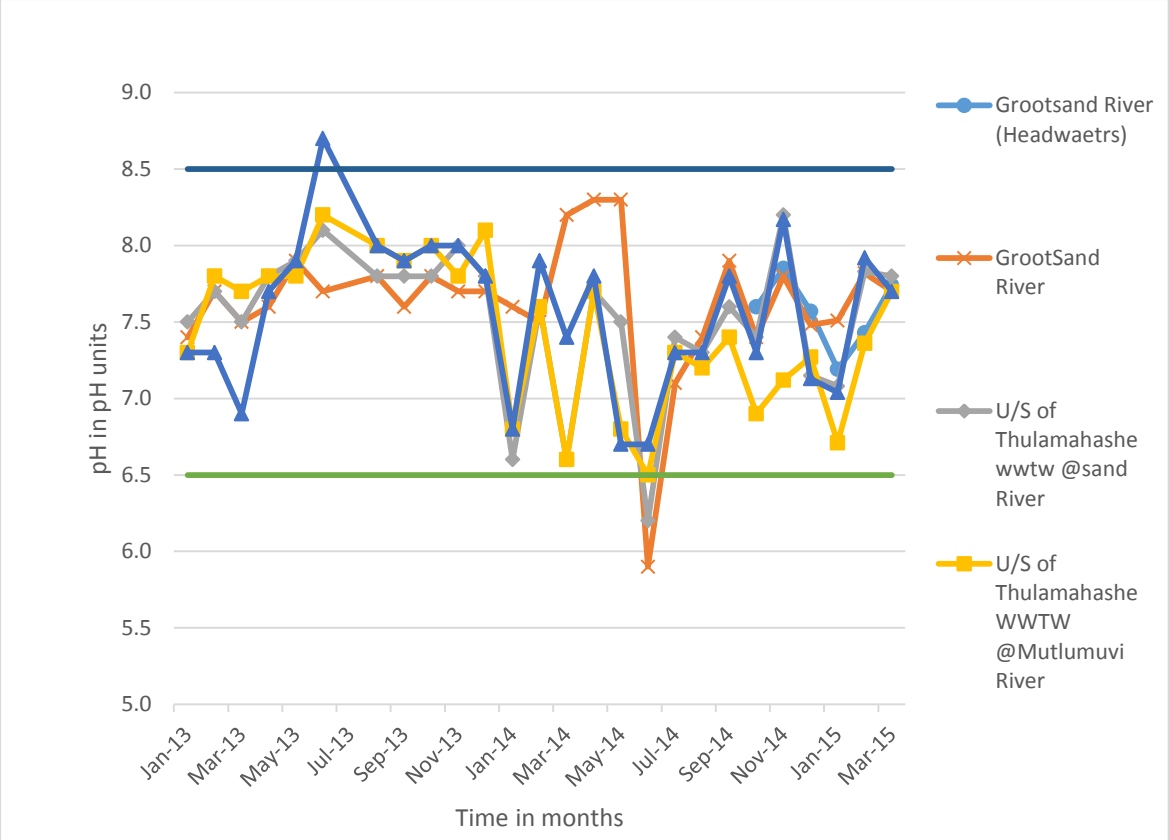


Figure 10: pH measured in the tributaries of Sand River

The pH of water in the Sand River is acceptable as it is neither acidic nor alkaline. The pH of most of the selected sites is acceptable, and ranges between 7.5 and 7.9. This is shown in figure 10 above.

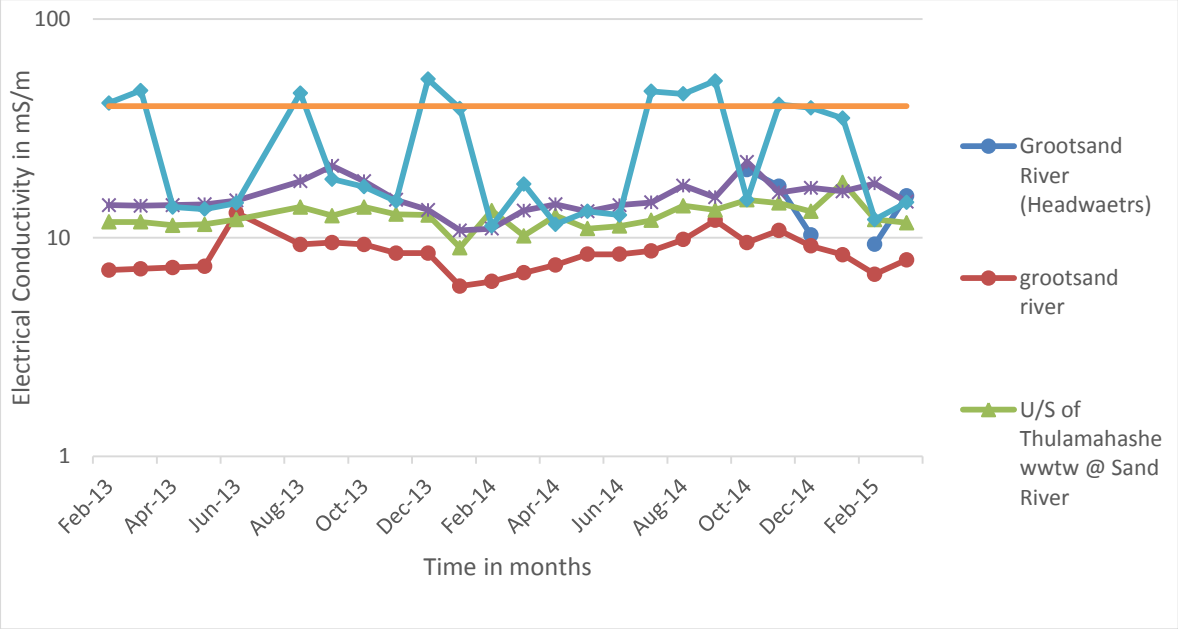


Figure 11: Electrical Conductivity measured in the tributaries of Sabie River

The chemical quality of water in the various tributaries of the Sand River is acceptable. Figure 11 above shows the levels of dissolved salts as indicated by measuring Electrical Conductivity (EC) over the reporting period which complies with the TWQG of 40 mS/m, although the quality deteriorates gradually or slightly as one proceeds downstream towards the confluence with the Sabie River.

The Thulamahashe WWTW is located between the Mutlumuvi and the Sand Rivers just before the two streams confluence. The quality of water upstream of the WWTW is relatively good, although it is deteriorating slightly compared to the headwaters. This may be attributed to runoff from agricultural activities in the area. However, there is a significant deterioration in the quality of water downstream of the WWTW, although the quality is still within the acceptable limit (TWQG) of 40 mS/m. This is attributed to the impact of the discharge from the Thulamahashe WWTW.

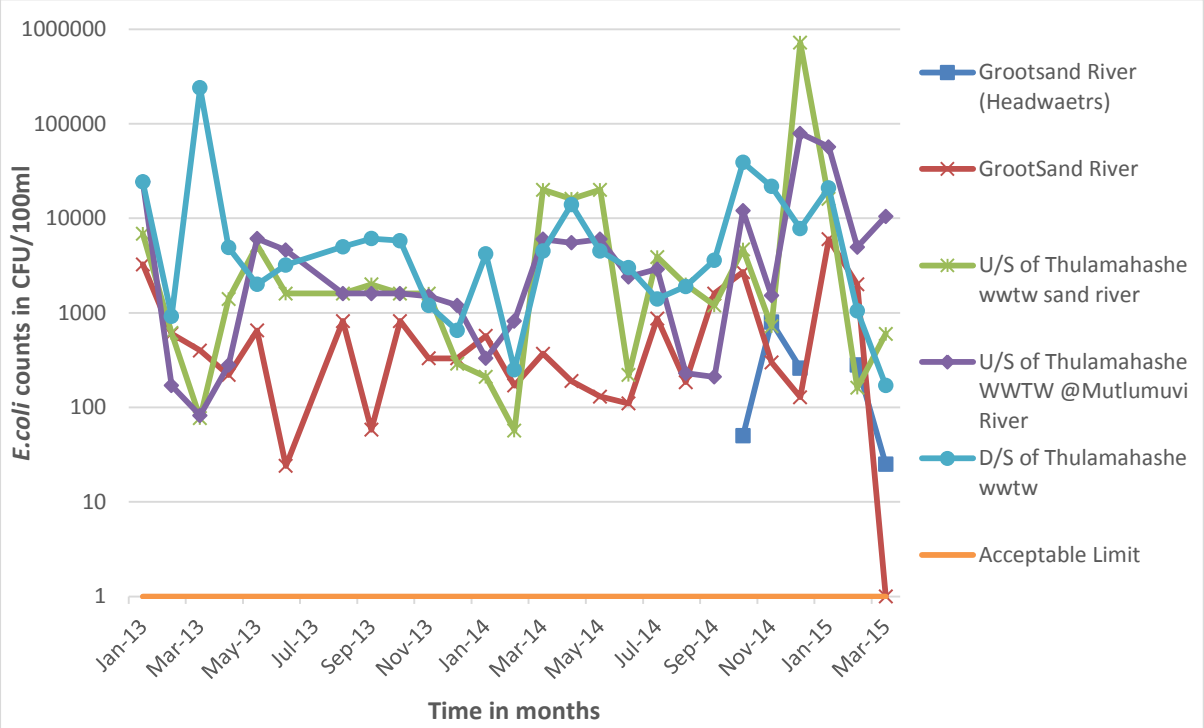


Figure 12: *E. coli* counts measured in the tributaries of Sabie River

The microbial quality of water in the Sand River is relatively good upstream at the headwaters but tends to deteriorate as the river proceeds downstream (see figure 12 above). The Mutlumuvi River upstream of the Thulamahashe WWTW shows elevated *E. coli* levels which increase drastically downstream of the Thulamahashe WWTW (see above figure).

The poor quality upstream of the WWTW is attributed to overflows from blocked manholes which are left for too long before they are fixed, while the downstream point shows the impact of partially treated discharge of wastewater from the Thulamahashe WWTW. The treatment plant is located between two streams, namely the Sand River and the Mutlumuvi River. The Thulamahashe WWTW discharges final effluent into the Sand River before it confluences with the Mutlumuvi River. The impact at the upstream point of the Thulamahashe WWTW is attributed to the manhole overflows from the township of Thulamahashe, which is also upstream of this monitoring point. Monitoring of the headwaters of the Grootsand was also recently commissioned and started in October 2014.

CHAPTER 2 :THE CROCODILE RIVER CATCHMENT

2.1 Introduction

The Crocodile River Catchment originates near Dullstroom, where it flows into the Kwena Dam and eastwards through Nelspruit and joins the Komati River (to become the Inkomati River) before entering Mozambique at Komatipoort. The Elands River and Kaap River are two large tributaries of the Crocodile River system. The other smaller tributaries of the Crocodile River include the Lunsklip River, Nels River, Houtbosloopspruit, Gladdespruit, White River and Besterspruit. The significant dams include the Kwena Dam, Ngodwana Dam, Witklip Dam, Klipkoppie Dam, Longmere Dam and Primkop Dam.

The Crocodile River Catchment is dominated by agricultural activities (pasture, dry land, or irrigated cultivation), forestry production, and rural and urban settlements. The middle region of the Crocodile River is characterised by increased urbanisation. The river flows through the major towns of Nelspruit, Kaapmuiden and Malelane. Commercial farming activities (sugar cane, fruit and vegetables) are also a feature of this catchment.

There are also mining activities in the Kaap River and the Sappi Mill in the Elands River Catchment. Illegal sand mining is posing a serious problem in the middle regions of the Crocodile River Catchment area (Kanyamazane area).

The construction of weirs and dams in the upper Crocodile Catchment to accommodate the increased trout farming near the towns of Dullstroom and Machadodorp has led to loss of wetland areas and is an overall threat to the water quality status of the river. The lower Crocodile Catchment forms the southern boundary of the internationally renowned Kruger National Park, with a number of tourist lodges built on the banks of the river that have a negative impact on the quality of the water (increased nutrients). In general the water quality in the upper Crocodile River Catchment appears to be in a good to fair condition, with the exception of the Elands River Sub-Catchment. This area is of concern as it reflects escalated concentrations of salts (and major ions) and nutrients.

Figures 13 and 14 show the map and the schematic representation respectively of the Crocodile Catchment and selected monitoring points.

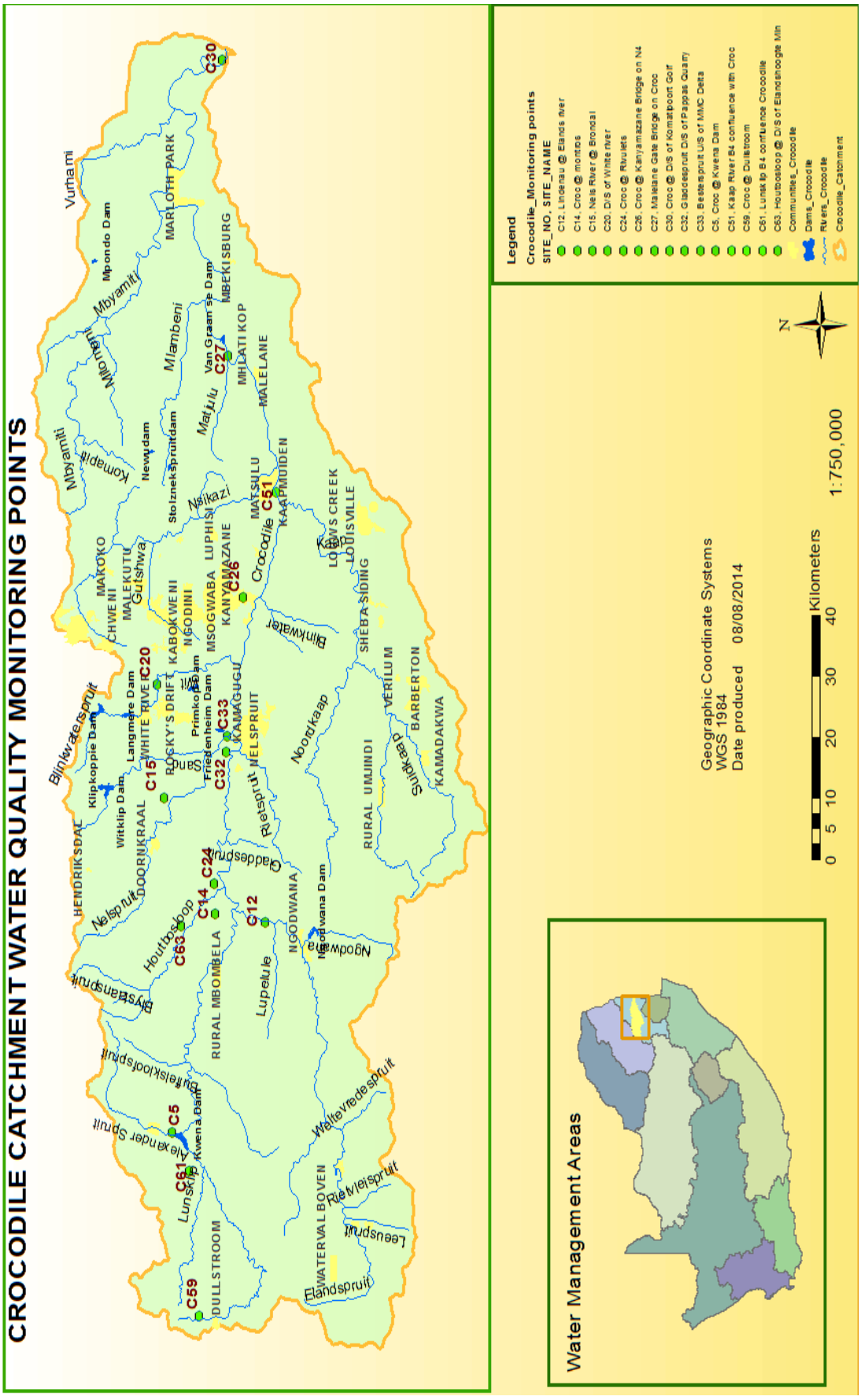


Figure 13: map of the Crocodile River catchment showing strategic monitoring points

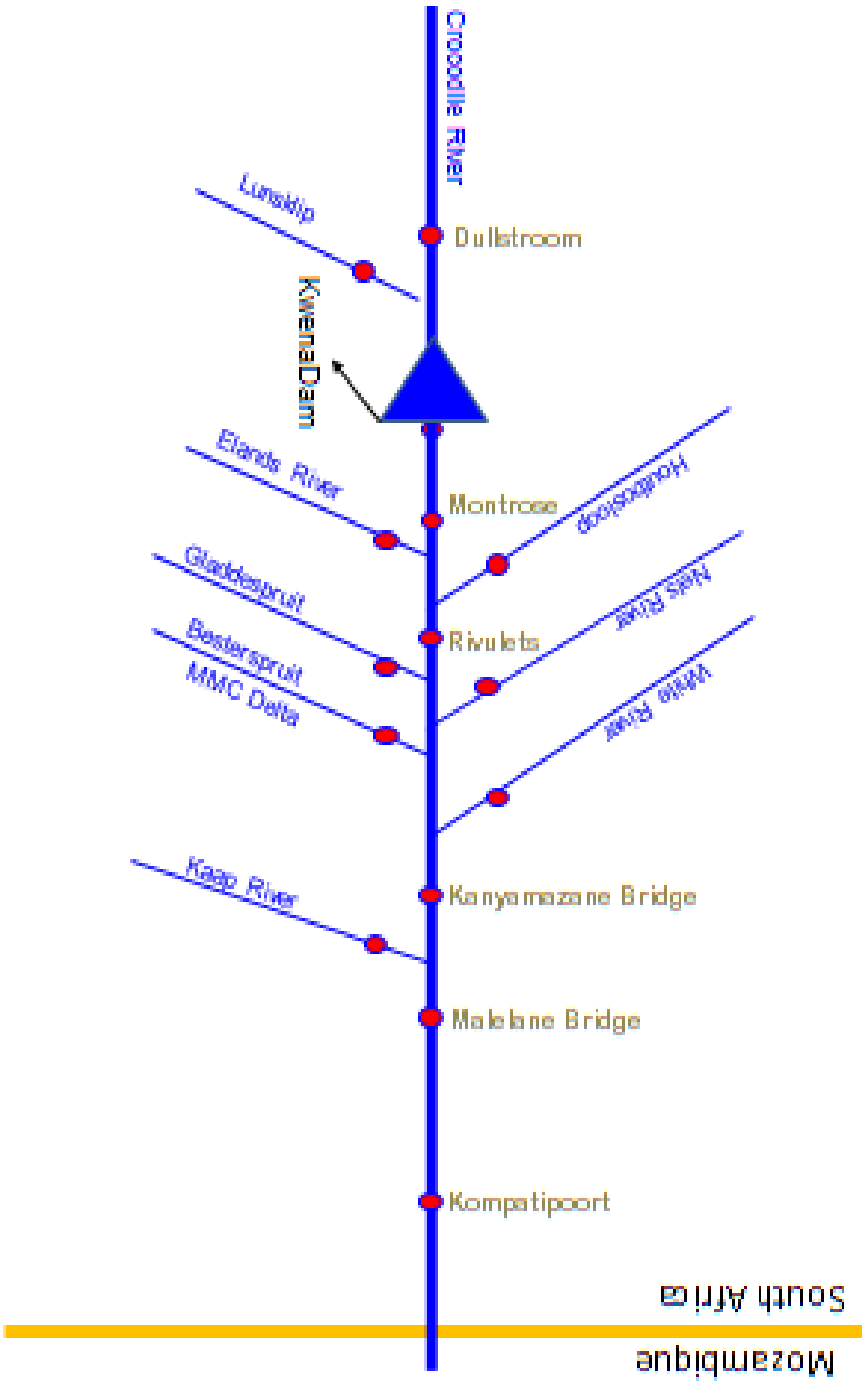


Figure 14: Schematic representation of the monitoring ponits in the Crocodile River and its tributaries.

A total of 15 monitoring points were selected on the Crocodile River and its major tributaries. Seven monitoring points are located in the main stem Crocodile River while the other eight are in the tributaries before the confluence with the Crocodile River. Table 3 contains details of the location of selected monitoring points.

Table 3: List of monitoring points indicating the site name, location and co-ordinates of the Crocodile River Catchment

SITE NO.	SITE NAME	RIVER	CO-ORDINATES	
			LAT (S)	LONG (E)
C59	Croc @ Dullstroom	Crocodile	25°24'42.58''	30°06'54.00''
C61	Lunsklip before confluence with Crocodile	Lunsklip	25°23'49.45''	30°19'47.75''
C5	Croc @ Kwena Dam	Crocodile	25°21'39.06''	30°23'09.67''
C12	Lindenau @ Elands River	Elands	25°31'40.51''	30°41'52.33''
C14	Croc @ Montrose	Crocodile	25°26'59.93''	30°42'36.11''
C63	Houtbosloop @ D/S of Elandshoogte Mine	Houtbosloop	25°22'38.35''	30°41'29.83''
C24	Croc @ Rivulets	Crocodile	25°25'09.01''	30°45'15.01''
C32	Gladdespruit D/S of Pappas Quarry	Gladdespruit	25°27'42.98''	30°57'00.00''
C33	Besterspruit U/S of MMC Delta	Besterspruit	25°27'51.01''	30°58'22.01''
C15	Nels River on Brondal	Nels	25°20'27.99''	30°52'54.01''
C20	D/S of White River	White	25°19'10.99''	31°02'58.99''
C26	Croc @ Kanyamazane Bridge on N4	Crocodile	25°29'57.01''	31°10'41.02''
C51	Kaap River before confluence with Croc	Kaap	25°32'30.01''	31°19'59.02''
C27	Malelane Gate Bridge on Crocodile	Crocodile	25°27'37.01''	31°32'04.99''
C30	Crocodile @ D/S of Komatipoort Golf Course before confluence with Komati River	Crocodile	25°26'16.01''	31°58'23.99''

2.2 Water Quality Status

The water quality results were compared to the Interim Water Quality Objectives (IWQO) set for the Crocodile River and these are shown in table 4 below.

Table 4: Table indicating Interim Water Quality Objectives set for the Crocodile River

Variable	Ideal	Acceptable	Tolerable
pH (pH Units)		6.5 – 8.4	
Conductivity (mS/m)	30	50	60
TSS (mg/l)	5	15	25
NH3-N (mg/l)	0.015	0.058	0.1
**PO4 (mg/l)	0.03	0.05	0.1
SO4 (mg/l)	20	40	60
NO3+NO2 (mg/l)	0.5	2	4
SAR	2	6	8
Chloride (mg/l)	25	40	50
Fluoride (mg/l)	0.2	0.5	0.75
Manganese (Mn) (mg/l)	0.02	0.10	0.30
Iron (Fe) (mg/l)	0.01	0.55	0.75
E. Coli (no/100 ml)	10	80	120
Arsenic (mg/l)	0.01	0.05	0.08
Aluminium (Al) (mg/l)	0.03	0.07	0.09

2.2.1 Water quality status of the Crocodile River

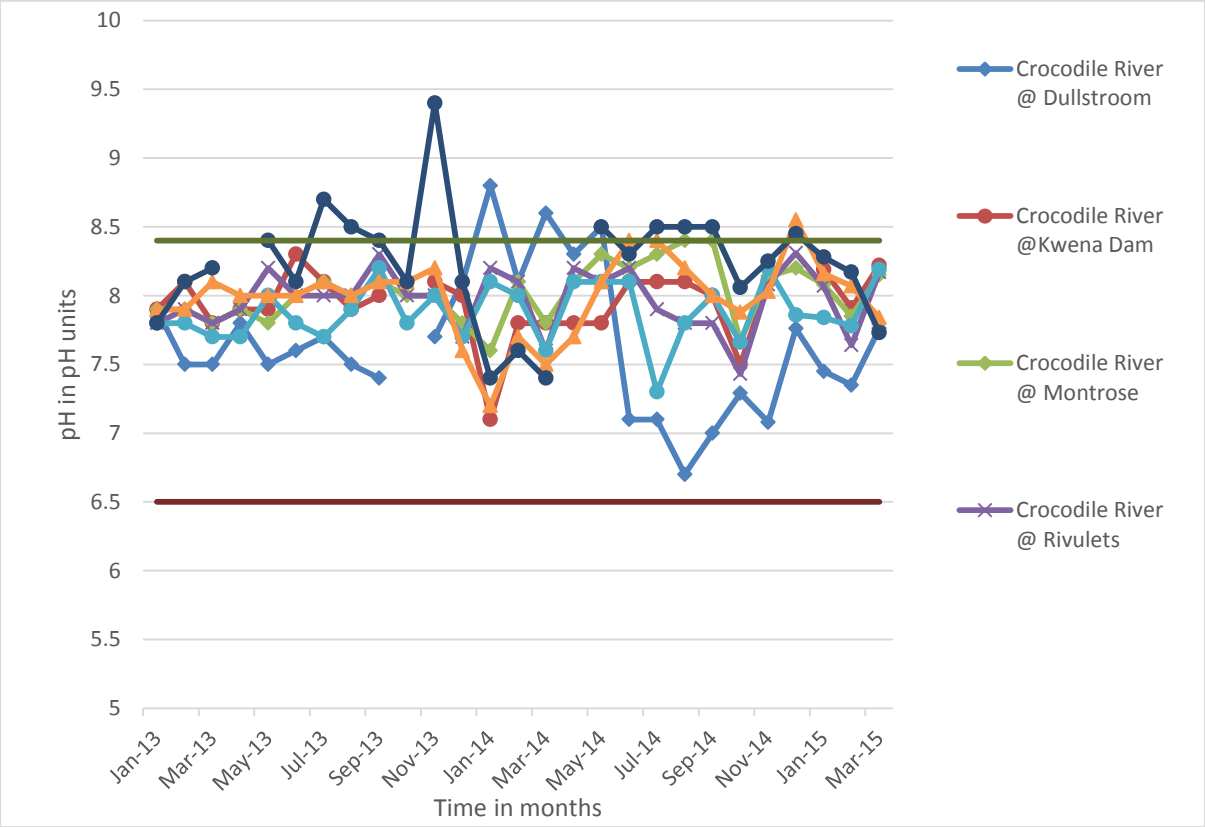


Figure 15: pH levels measured in the Crocodile River

The monitoring points at Dullstroom and downstream of Komatipoort golf course showed slightly elevated pH during March and May 2014. The elevated pH at Dullstroom monitoring point was

expected due to the geology of the area. The elevated pH levels downstream of Komatipoort golf course monitoring point occurred for almost half of the duration of the reporting period. This impact in water quality can be attributed to the return water flows from the agricultural activities in the area resulting from soil conditioning with lime which is common practice in agriculture.

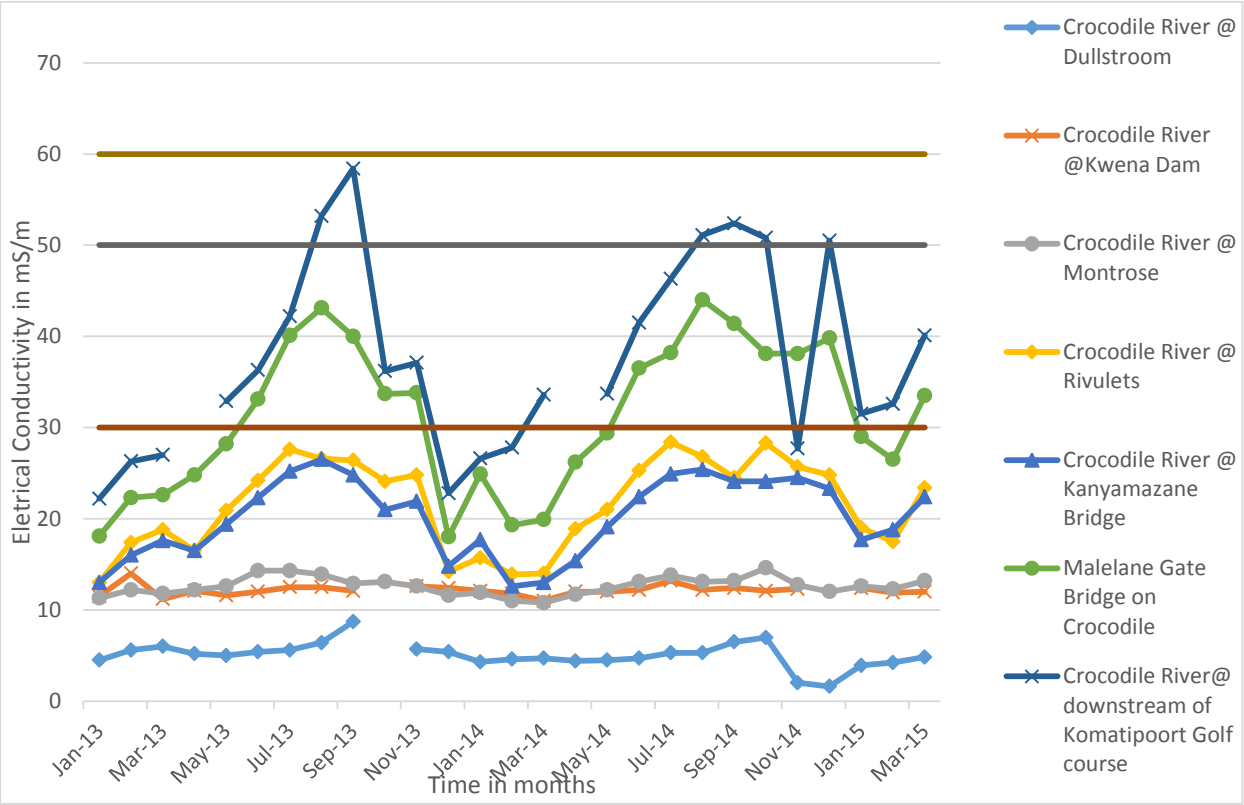


Figure 16: Electrical Conductivity measured in the Crocodile River

The chemical quality of water in the Crocodile River is good and ranges between the ideal and acceptable levels (see figure 16 above) when compared to the Interim Water Quality Objectives (IWQO's). The electrical conductivity levels in the mainstem of the Crocodile River Catchment have been consistently below the tolerable limit of the Interim Water Quality Objectives. The EC levels as measured downstream of Komatipoort golf course monitoring point at the Crocodile River seems to be deteriorating and is the only point which encroached just below the tolerable level. This can be attributed to the return flow from sugar cane irrigation in the area and discharge of partially treated wastewater from Komatipoort WWTW and the recurring manhole spillages.

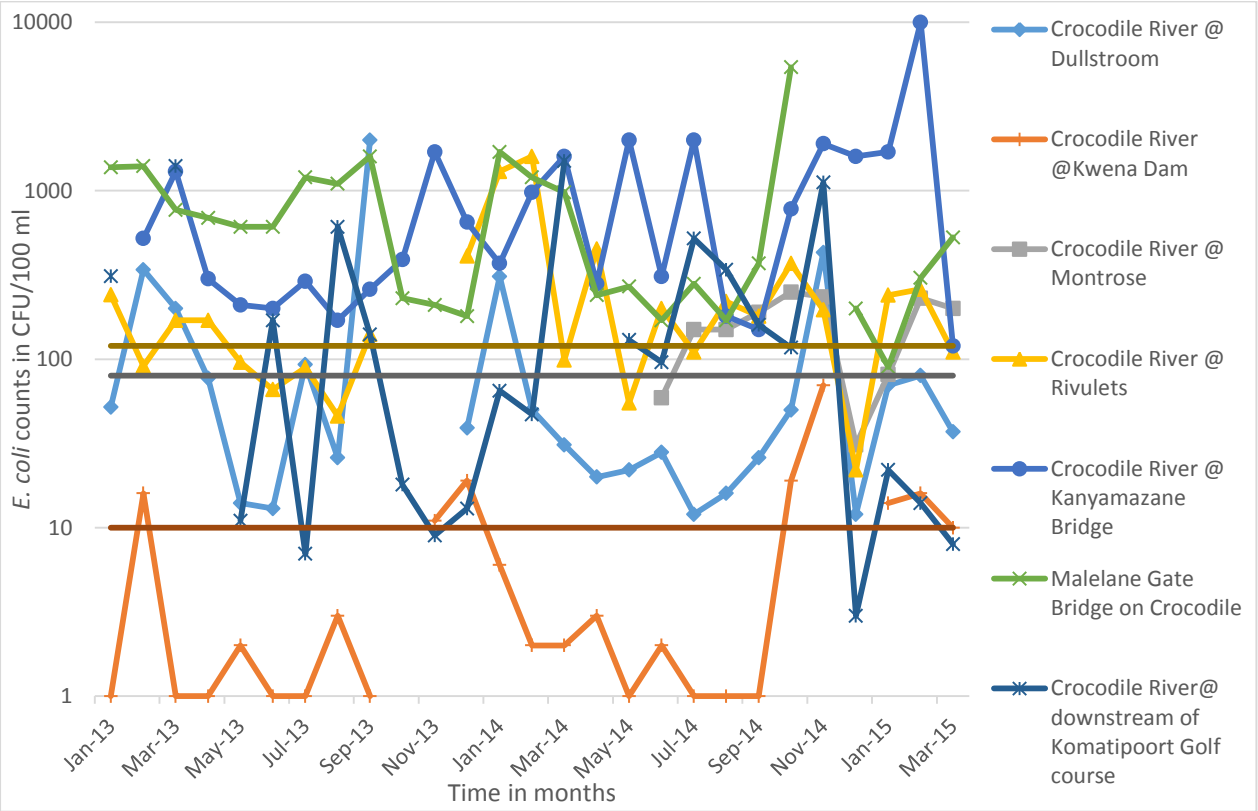


Figure 17: *E. coli* counts measured in the Crocodile River

E. coli counts in the main stem of the Crocodile River (figure 17) showed the lowest counts at Kwena Dam ranging within acceptable limits in comparison to other monitoring points in the mainstem of the Crocodile River Catchment. The Crocodile River at Dullstroom showed high *E. coli* counts which periodically exceeded the tolerable limit except for five months during the reporting period. The Dullstroom monitoring point measures the background water quality at the headwaters of the Crocodile River. However, there is sewage pump station in this area which often spills contributing to high levels of *E. coli* counts.

The other factor which contributes to the high *E. coli* in this catchment is the Municipal WWTW and pump stations which are constantly failing due to lack of maintenance, being operated above the design capacity. The highest *E. coli* count was experienced at the Kanyamazane Bridge monitoring point which is located downstream of Kanyamazane WWTW and Kanyamazane residential area. The Kanyamazane stream which passes through residential area also contributes high levels of E. *coli* counts at this point exceeding the tolerable limit.

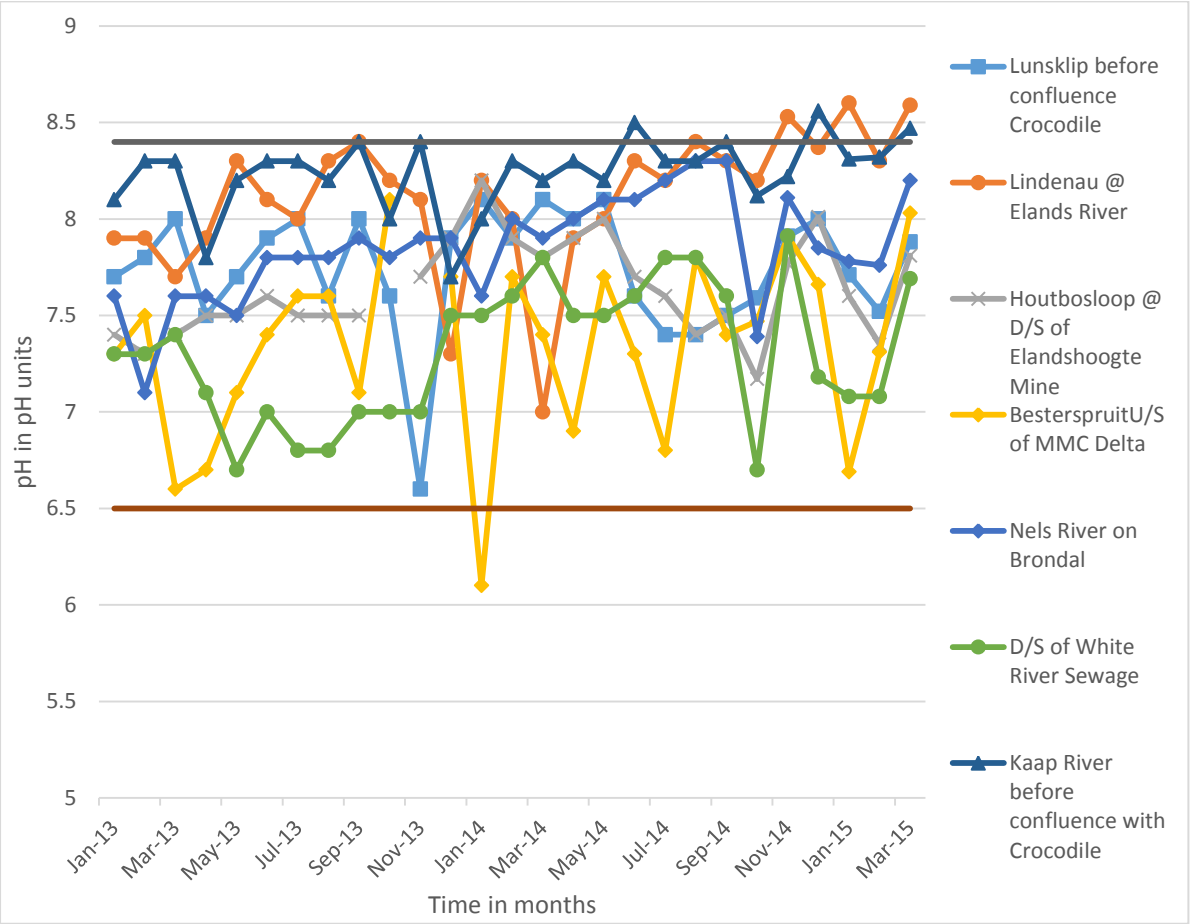


Figure 18: pH levels in the tributaries of the Crocodile River

The pH ranges in the tributaries of the Crocodile River (figure 18) ranged from 6.1 to 8.59 for all the monitoring points exceeding the upper limit slightly in the Elands and Kaap Rivers. pH is therefore not a problematic variable in the crocodile River tributaries as well.

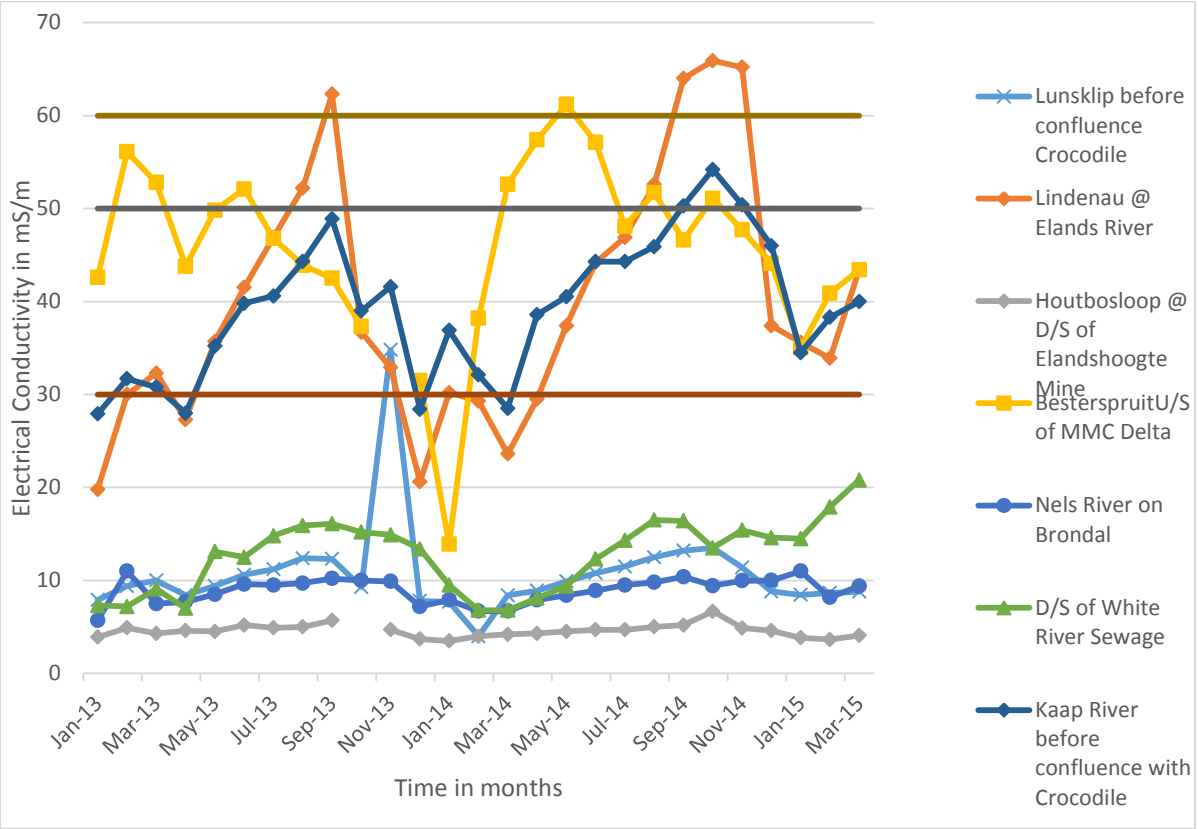


Figure 19: Electrical Conductivity measured in the tributaries of the Crocodile River

Electrical conductivity in the tributaries of the Crocodile River showed seasonality (see figure 19) ranging between 3.9 and 20.8 in the Lunsklip, Houtbosloop, Nels and White Rivers. All these tributaries complied with the ideal limit over the reporting period. The remaining tributaries also showed seasonality and fell below the ideal limit during the wet season while encroaching into the tolerable limit during the dry seasons. This shows high levels of dissolved salts that concentrate during low flow periods. The tributaries that show this behaviour are the Elands River, Besterspruit and the Kaap River. The high levels of salts in these tributaries are attributed to the activities in the catchments of these tributaries such as irrigated effluent in the Elands River, dense settlement impacts in the Besterspruit as well as irrigation return flows in the Kaap River.

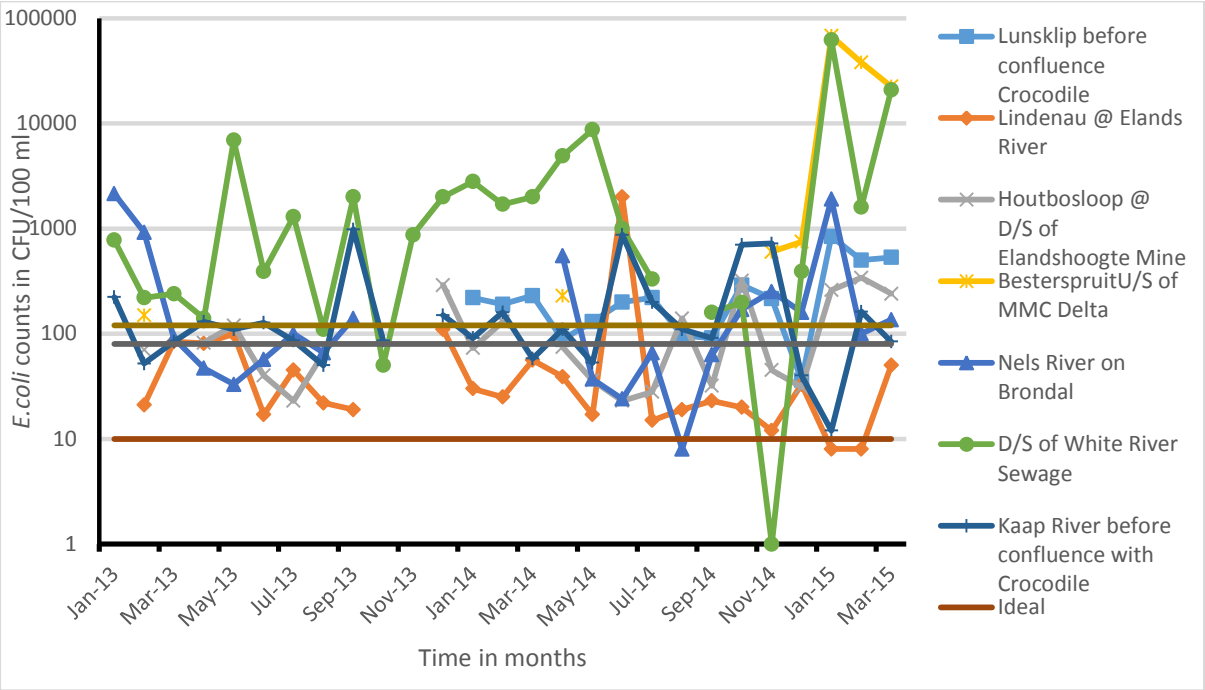


Figure 20: *E. coli* measured in the Crocodile River tributaries on monthly basis.

The *E.coli* counts in the tributaries of the Crocodile River showed very high counts for most of the reporting period with the highest count recording 62 000 counts per 100mℓ (see figure 20). This occurred at a point downstream of White River sewage and is attributed to the occasionally breakage of the pump station at White River (Hillsview pump station) which spills raw sewage into the water resource.

The most problematic variable of concern in the Crocodile River Catchment is *E. coli*. The continuous malfunctioning and breakdown of pump stations which spill untreated sewage also contribute to the observed *E. coli* counts. Municipal WWTW that are not upgraded also contribute to the elevated *E. coli* counts observed in the water resource since disinfection is not effective.

CHAPTER 3: THE KOMATI RIVER CATCHMENT

3.1 Introduction

The Incomati basin is an international basin shared between South Africa, Swaziland and Mozambique and is named after the Inkomati River as the main river. The Komati River is the main stem of the Inkomati Water Management Area on the South African side and originates from the outflow of the Nooitgedacht Dam next to Carolina, Mpumalanga Province. The catchment of the Nooitgedacht Dam includes the Boesmanspruit and the Vaalwaterspruit tributaries which feed directly into the dam.

The most unique feature of the Komati River is that it starts in South Africa and flows through Swaziland in a north-easterly direction and comes back to South Africa at the Mananga Border Gate. It then joins up with the Crocodile River (one of its main tributaries) at Komatipoort before it enters Mozambique. The Inkomati River confluences with the Sabie River, which is another one of its main tributaries, in Mozambique. After entering Mozambique, the Komati River is referred to as the Incomati River and it flows into the Indian Ocean at Maputo Bay. From source to mouth, the length of the Inkomati River is 480 kilometres (Mikiyasu, 2003).

On the South African side, there are a number of dams/reservoirs that store water for use during the dryer seasons of the year. These include the Nooitgedacht and Vygeboom Dams which are strategically important for the country's power generation and whose activities occur outside of the Inkomati Water Management Area. The Driekoppies and Maguga Dams were built jointly by South Africa and Swaziland to support irrigation and other users in both countries and to ensure that adequate water is available to Mozambique to meet its developmental needs. The Maguga Dam is in Swaziland. The allocation from the two dams to South Africa and Swaziland as well as their international obligations towards Mozambique are managed through the Komati Basin Water Authority (KOBWA).

This report focuses on the water quality status of the tributaries that feed the Komati River before the confluence with its main tributary of the Crocodile River, as well as selected points along the main stem of the Komati River. The Komati Catchment consists of Chief Albert Luthuli and Nkomazi Local Municipalities. These municipalities have Wastewater Treatment Works (WWTW) that discharge wastewater into the Komati River and some of its tributaries. The WWTW are poorly maintained. The catchment is dominated by coal mining in its upper reaches and irrigation agriculture in its lower reaches.

For the purposes of this report the Komati River upstream of Swaziland will be referred to as the Upper Komati while downstream of Swaziland, it will be referred to as the Lower Komati. Figures 21 and 22 below show the map and the diagrammatic representation respectively of the Komati Catchment and the strategic monitoring points.

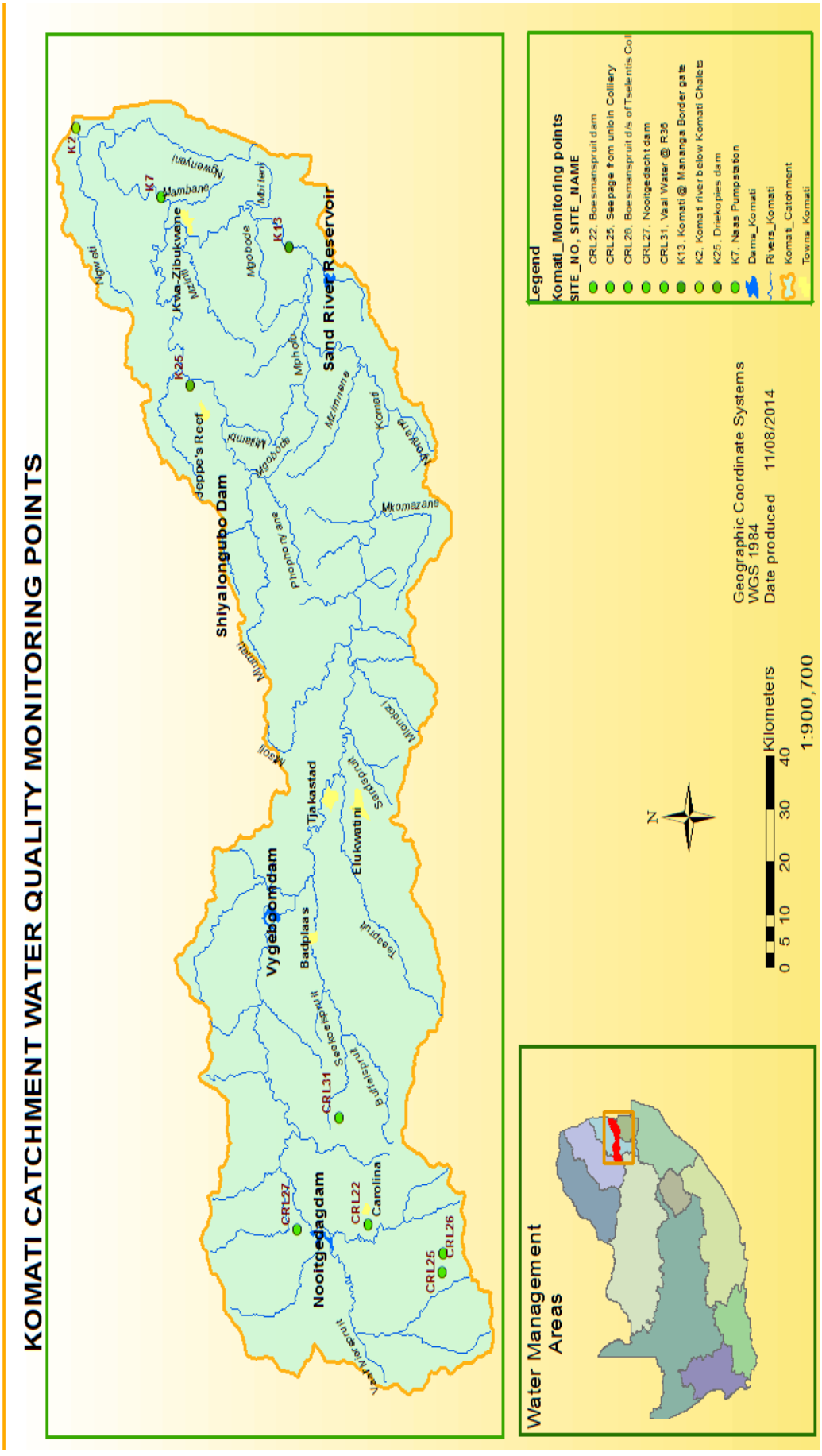


Figure 21: Map of the Komati River showing strategic monitoring ponits

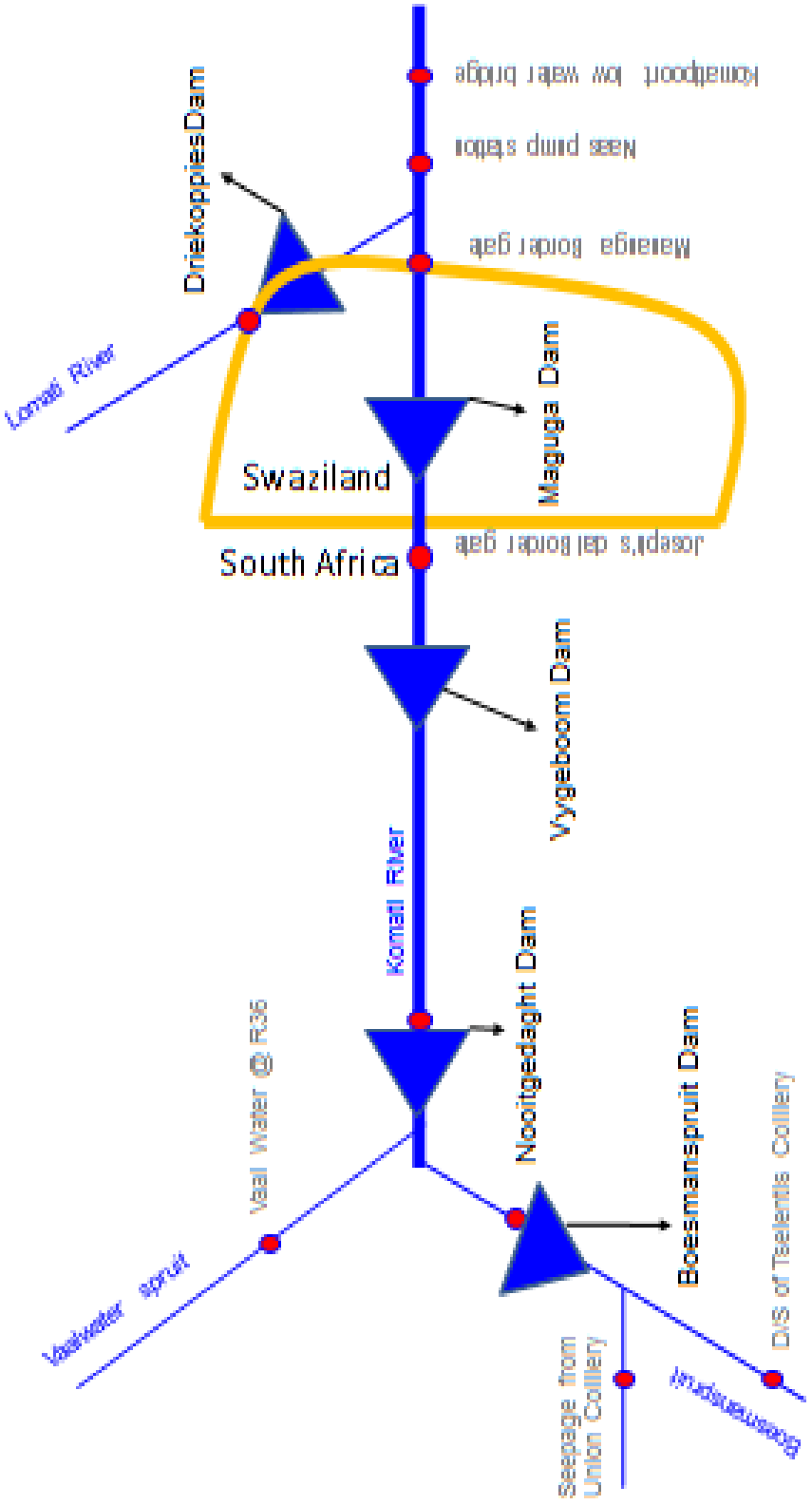


Figure 22: Schematic representation of the Komati River showing strategic monitoring ponits

A total of Nine monitoring points were selected in the main stem of the Komati River and its tributaries. Four of the monitoring points were in the main stem of the Komati River from the outflow of the Nooitgedacht Dam until its confluence with the Crocodile River at Komatipoort, while the other five monitoring points were in some of the tributaries of the Komati River. Table 5 contains details of the location of selected monitoring points.

Table 5: Selected monitoring points in the Komati River and its tributaries

SITE NO.	SITE NAME	RIVER	CO-ORDINATES	
			LAT (S)	LONG (E)
CRL22	Boesmanspruit Dam	Boesmanspruit	26º 05´ 50.1"	30º 5´ 25.2"
CRL25	Seepage from Union Colliery	Boesmanspruit	26º 14´ 16.2"	30º 0´ 34.4"
CRL27	Nooitgedacht Dam	Komati	25º 56´ 52.9"	30º 04´ 57.7"
CRL31	Vaal Water @ R36	Vaalwaterspruit	25º 0´ 26"	30º 01´ 38.2"
CRL26	Boesmanspruit D/S of Tselentis Colliery	Boesmanspruit	26º 14´ 11.6"	30º 2´ 29.1"
K2	Komati River below Komati Chalets	Komati	25º 26´ 35.6"	31º 57´ 51"
K7	Naas Pump Station	Komati	25º 38´ 27"	31º 50´ 43.7"
K13	Komati @ Mananga Border Gate	Komati	25º 55´ 55.9"	31º 45´ 36.7"
K25	Driekopies Dam	Mlumati	25º 42´ 43.7"	31º 31´ 24.7"

3.2 Water Quality Status

The samples were analysed by a SANAS-accredited laboratory. Since the Komati River does not have Interim Resource Quality Objectives, the Target Water Quality Guidelines were used for comparison purposes to determine compliance with the most stringent objectives that protect the fitness for use for the most sensitive user. Table 6 below shows the Target Water Quality Guidelines for relevant variables of concern. As indicated elsewhere in this document, indicator variables were selected for the purposes of this report to demonstrate the status of water quality in the Komati River Catchment.

Table 6: Target Water Quality Guidelines for relevant variables of concern for the Komati River

Variable	Target Water Quality Guidelines	Uniform Effluent Standards	
		General	Special
pH (pH Units)	6.5-8.5	5.5-9.5	5.5-7.5
Conductivity (mS/m)	0-40	intake+75%; 250	intake+15%; 250
E. coli (CFU/100 ml)	0	0	0
Ammonia (mg/l)	0-1.0	10	1.0
Calcium (mg/l)	0-32		
Magnesium (mg/l)	0-30		1.5
Nitrate & Nitrite (mg/l)	0-6		1.5
Soluble Ortho-Phosphate (mg/l)	0.005-0.025		1.0
Sodium (mg/l)	0-70	Intake +90	Intake +50
Sulphate (mg/l)	0-200		
Aluminium (mg/l)	0-0.15		
Iron (mg/l)	0-0.1		0.3
Manganese (mg/l)	0-0.02	0.4	0.1

3.2.1 Water quality status of the Komati River

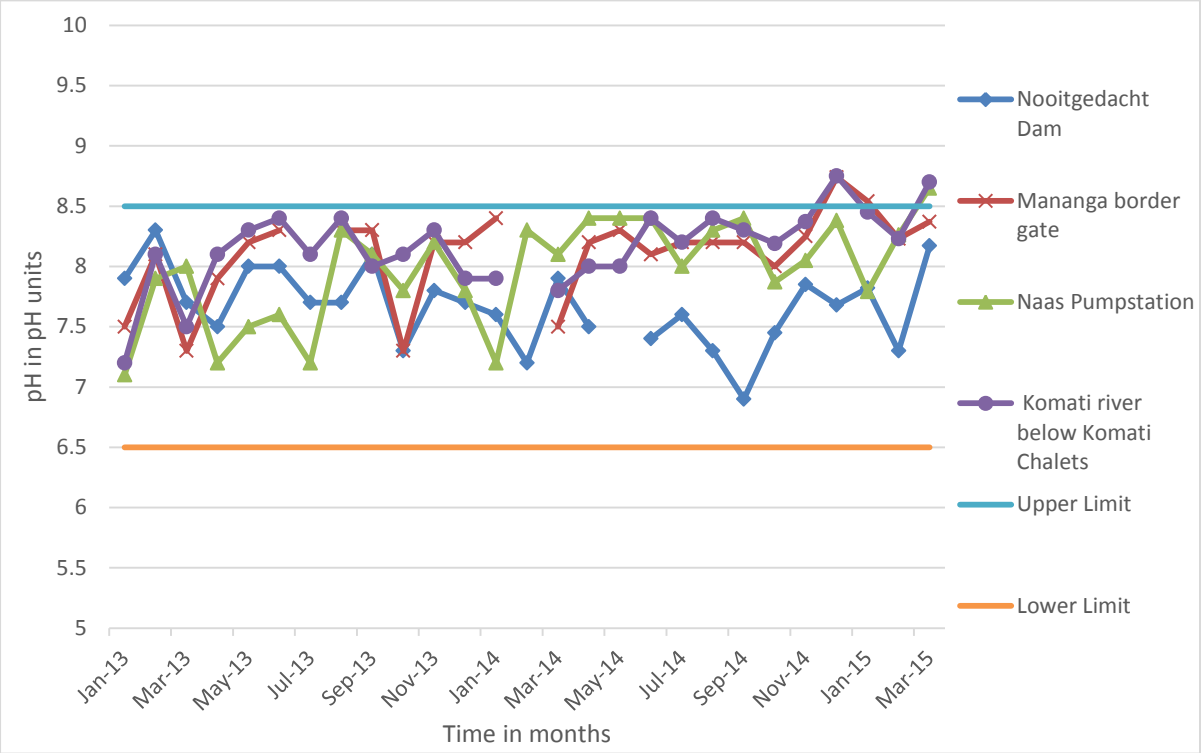


Figure 23: pH measured in the Komati River

The pH of the water resources as shown in figure 23 above fell within the acceptable limits for pH for almost the entire reporting period, except for two monitoring points which showed a slight increase above the upper limit at the end of the reporting period. These are at Mananga border and below the Komati Chalets. These areas are characterized by irrigation agriculture and the high pH in these areas is attributed to irrigation return flows emanating from soils conditioned with lime, which is normal practice in agriculture.

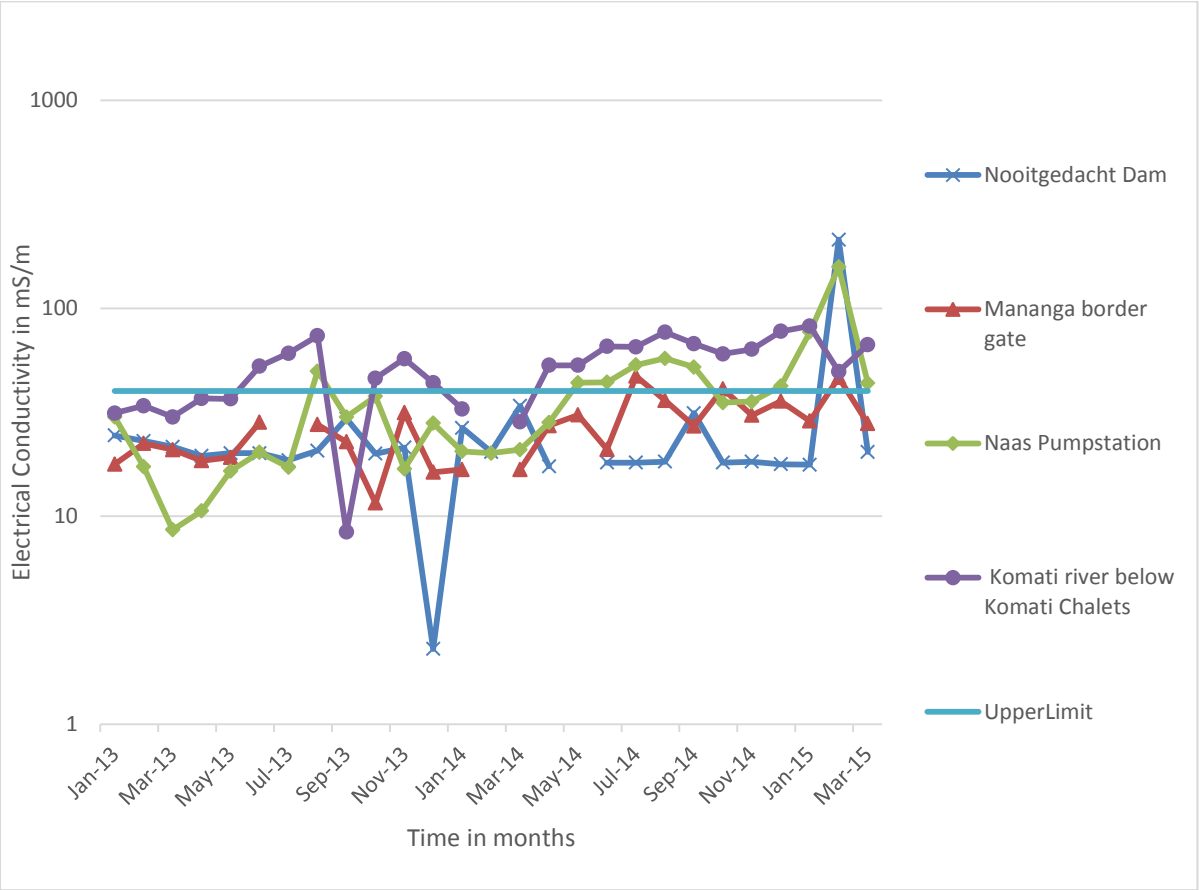


Figure 24: Electrical Conductivity measured at the Komati River

The concentration of dissolved salts as indicated by measuring electrical conductivity (figure 24) shows exceedance of the TWQG of 40 mS/m below the Komati Chalets for most of the reporting period and periodically at the Naas pump station. These two points as reported above are characterised by irrigated agriculture and the impact is associated with return flows emanating from soils conditioned with lime.

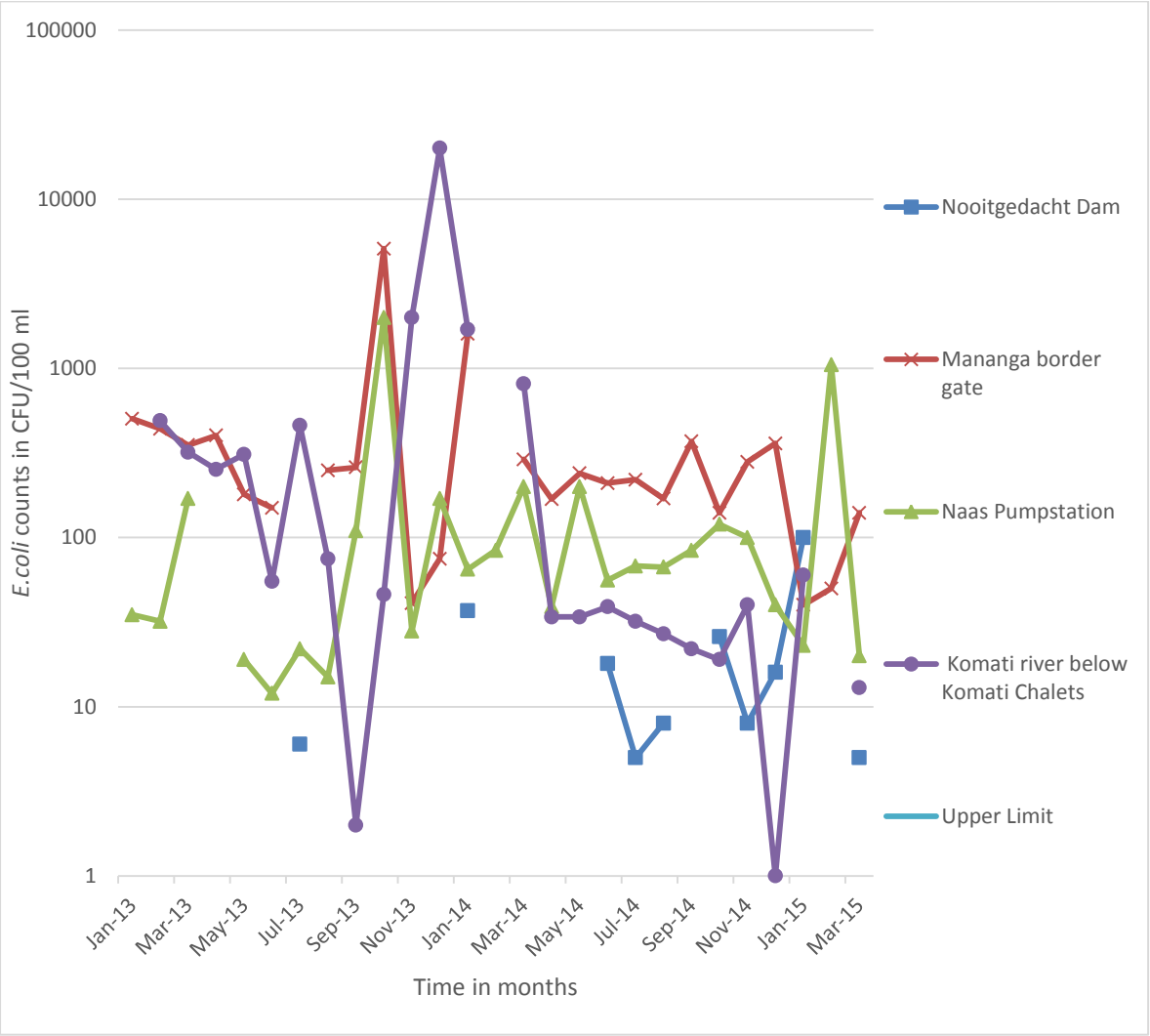


Figure 25: *E. coli* counts measured in the Komati River

According to the TWQG, the limit for *E.coli* is 0 CFU/100ml. Although fluctuating, the overall trend on the number of cfu/100 of *E. coli* seems to be decreasing over the reporting period (see figure 25 above). It is worrying to note that a large water body such as the Nooitgedacht dam has such a high count of E. coli at its outflow. This is attributed to overflows from Carolina manholes and pump stations as well as the discharge of partially treated waste water from WWTW in Carolina and Breyton.

The Mananga Border gate recorded *E.coli* counts of about 504 CFU/100ml and fluctuates from 41 CFU/100ml in November 2013 to about 1600 CFU/100ml in January 2014. The Komati River below Komati river chalets recorded the highest count of 2000 CFU/100ml in November 2013, this can be attributed to the number of guest houses using the septic tank system along that stretch of river. In summary, none of the monitoring points complied with the TWQG for the reporting period. This is a cause for concern since this has impact not only on local users but on neighbouring countries and *vice versa* specially since the Komati flows into Swaziland and back into South Africa again.

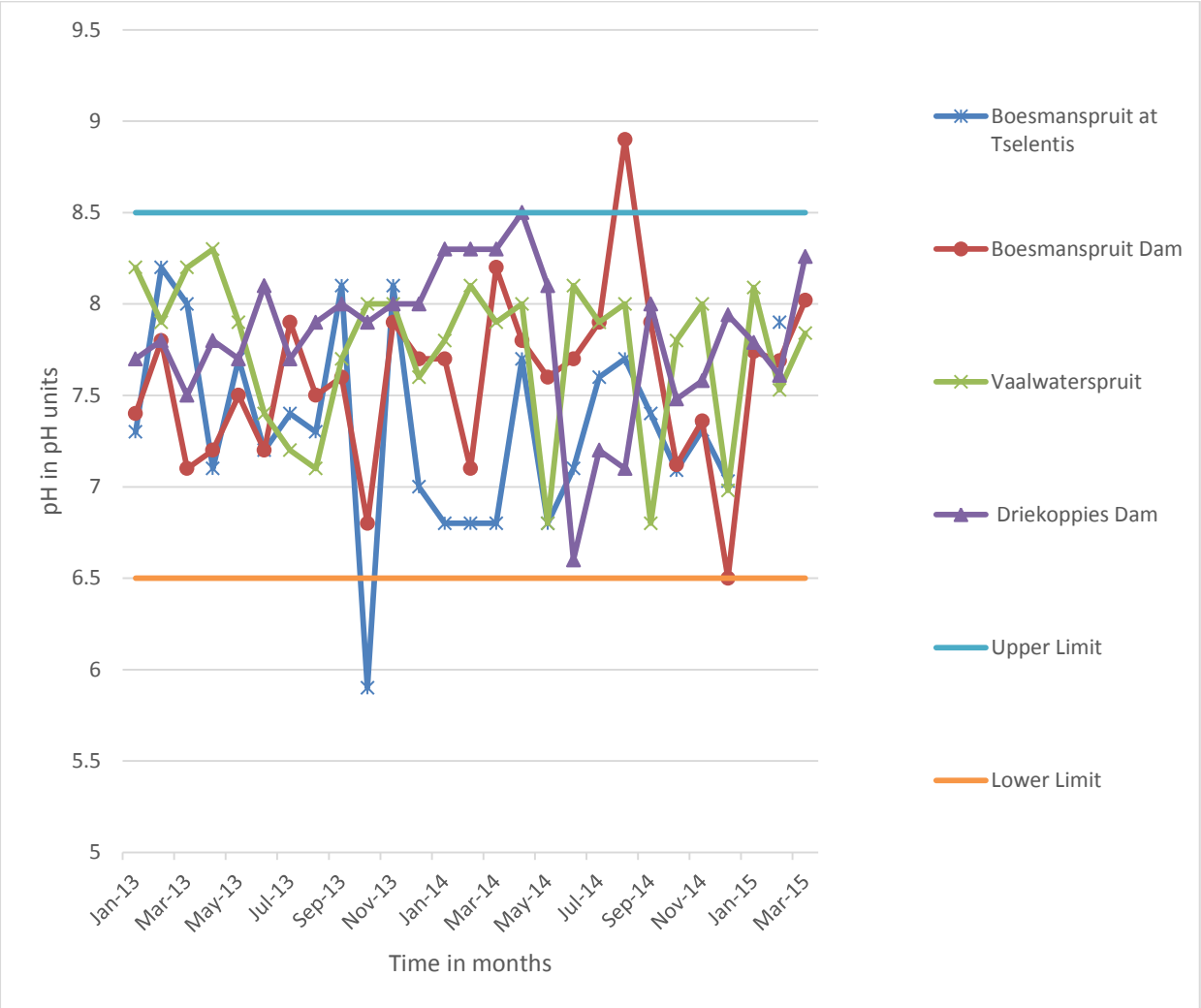


Figure 26: pH measured in the tributaries of the Komati River

The pH reading for the selected points were all within the acceptable levels except for the isolated cases of Boesmanspruit at Tselentis and Boesmanspruit dam which recorded 5.9 and 8.9 respectively (see figure 26 above). The pH is therefore not a concern in the area and has shown to be stable over the reporting period, albeit with isolated fluctuations (spikes) here and there.

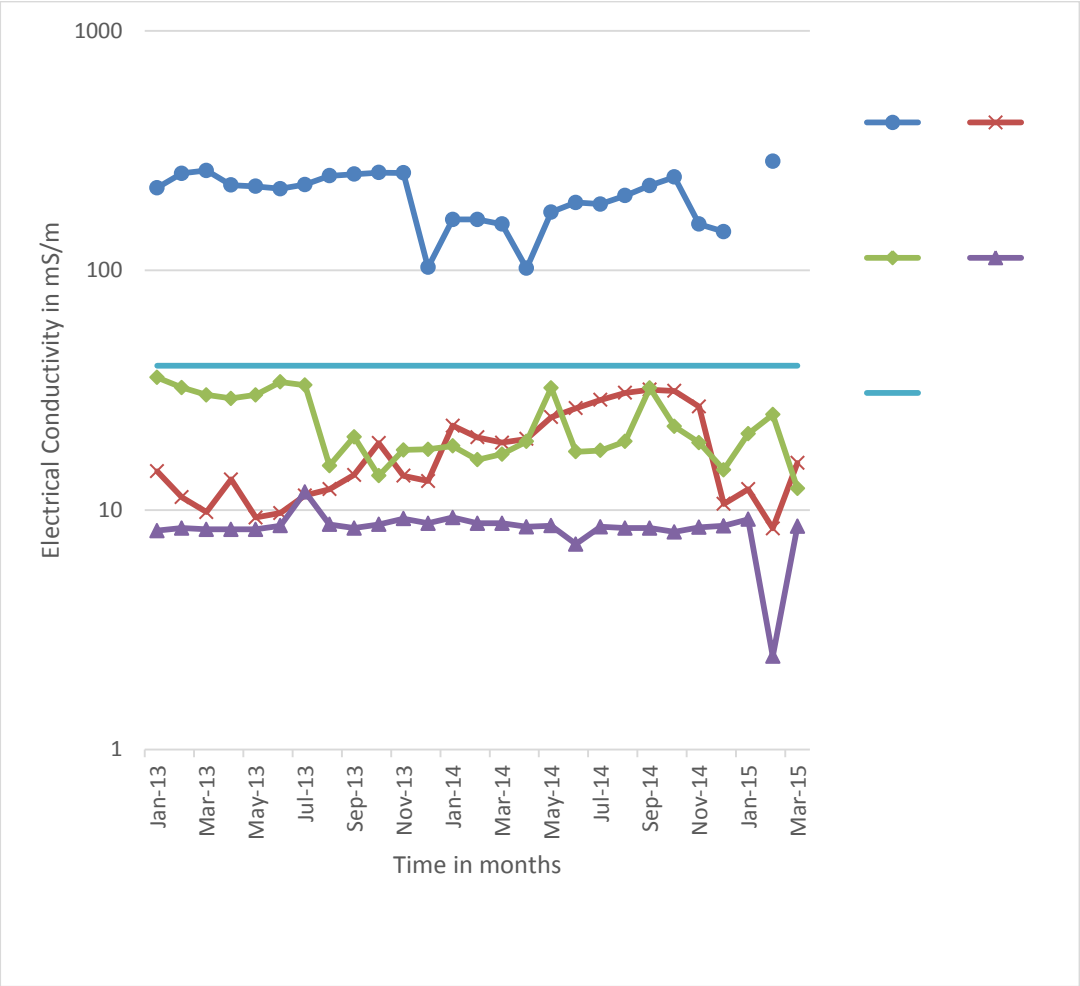


Figure 27: Electrical Conductivity measured at the tributaries of the Komati River

The concentration of dissolved salts as measured by electrical conductivity in the tributaries of the Komati River showed compliance to the TWQG limit of 40 mS/m throughout the reporting period except at the monitoring point Boesmanspruit at Tselentis (se figure 27 above). This high concentrations of dissolved salts can be attributed to the impacts of mining activities at Tselentis Colliery.

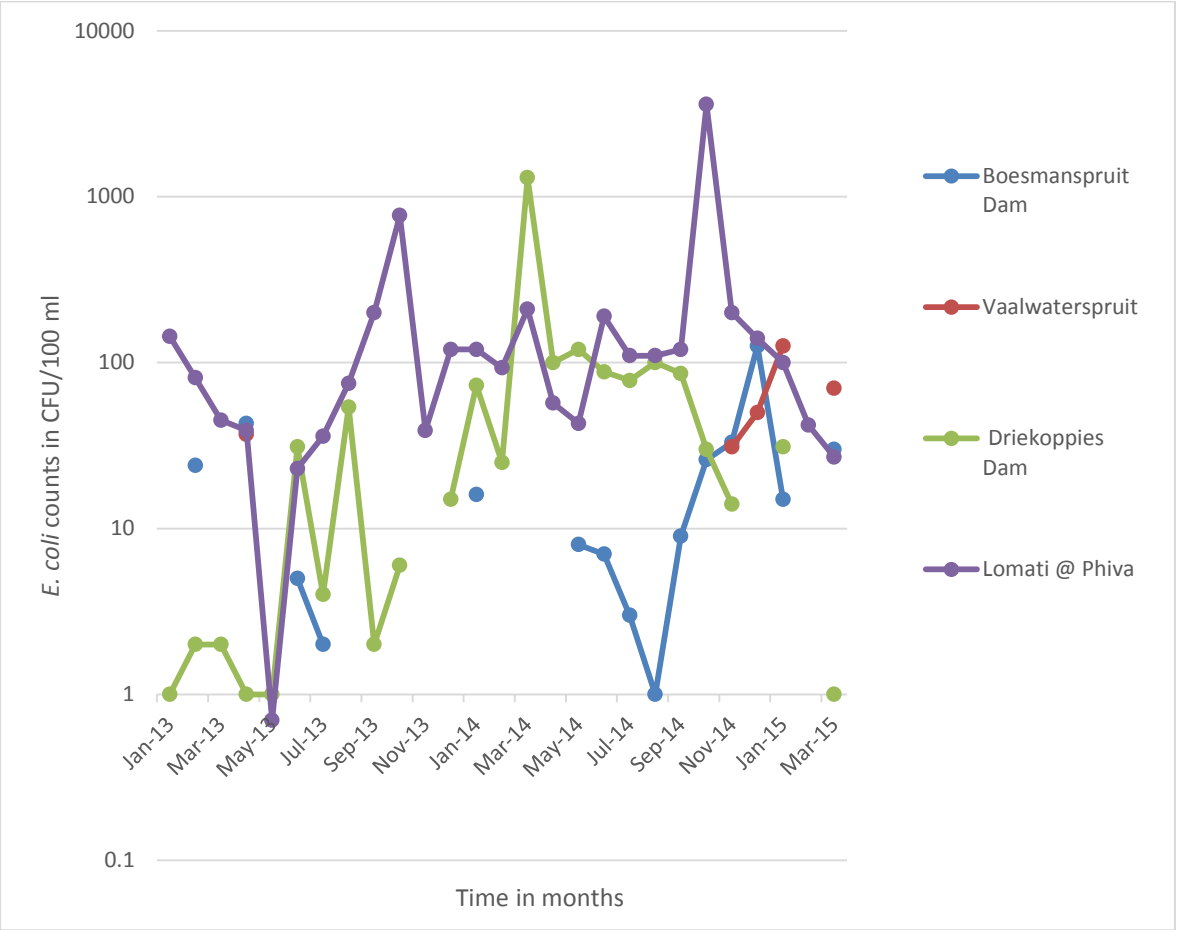


Figure 28: *E. coli* measured at the tributaries of the Komati River

From January 2013 to march 2015, all the selected monitoring points did not comply with the TWQG limit of 0 CFU/100ml. the one that recorded the highest elevations throughout is the Lomati river at Phiva. This point is located downstream of the phiva settlement showing the impact of pit latrines and septic tanks from this settlement on water resources. Illegal dumping of refuse emanating from this settlement is also prevalent and often most of the litter also finds its way into the water resources.

CHAPTER 4: USUTHU CATCHMENT

4.1 Introduction

The headwaters of the Usutu River emerge from the highlands of Amsterdam, Mpumalanga province, flow through the Kingdom of Swaziland and Mozambique before entering the Indian Ocean. The Usuthu Catchment is unique from the other three catchment due to the short distance from the headwaters to the border with Swaziland. Consequently, it has independent rivers that start at the source and flow directly into a neighbouring country before confluencing with the main stem. While it is clear that the main stem is the Usuthu River, the other tributaries confluence with the Usuthu River in Swaziland. These tributaries are the Mpuluzi, bordering the Usuthu River to the north, and Sandspruit immediately south of the Usutu River, followed by the Hlelo and Assegaai consecutively to the south.

The Usutu catchment is characterised by large transfers out of the catchment (and out of the WMA) to the Vaal and Olifants Water Management Areas mainly for cooling purposes at ESKOM power stations but also for other economically important activities. This catchment is therefore a water producing area and therefore a strategic area whose level of protection should be elevated. Pollution of these strategic water resources will significantly impact on power generation and the economy of the country at large. Four large dams in the Usutu support these transfers, namely; Heyshope, Morgenstond, Westoe and Jericho dams.

The major activities in the catchment include forestry, mining and agricultural activities and municipal wastewater treatment works. Figure 29 below shows the map of the Usuthu catchment and strategic monitoring sites selected for the purpose of this report.

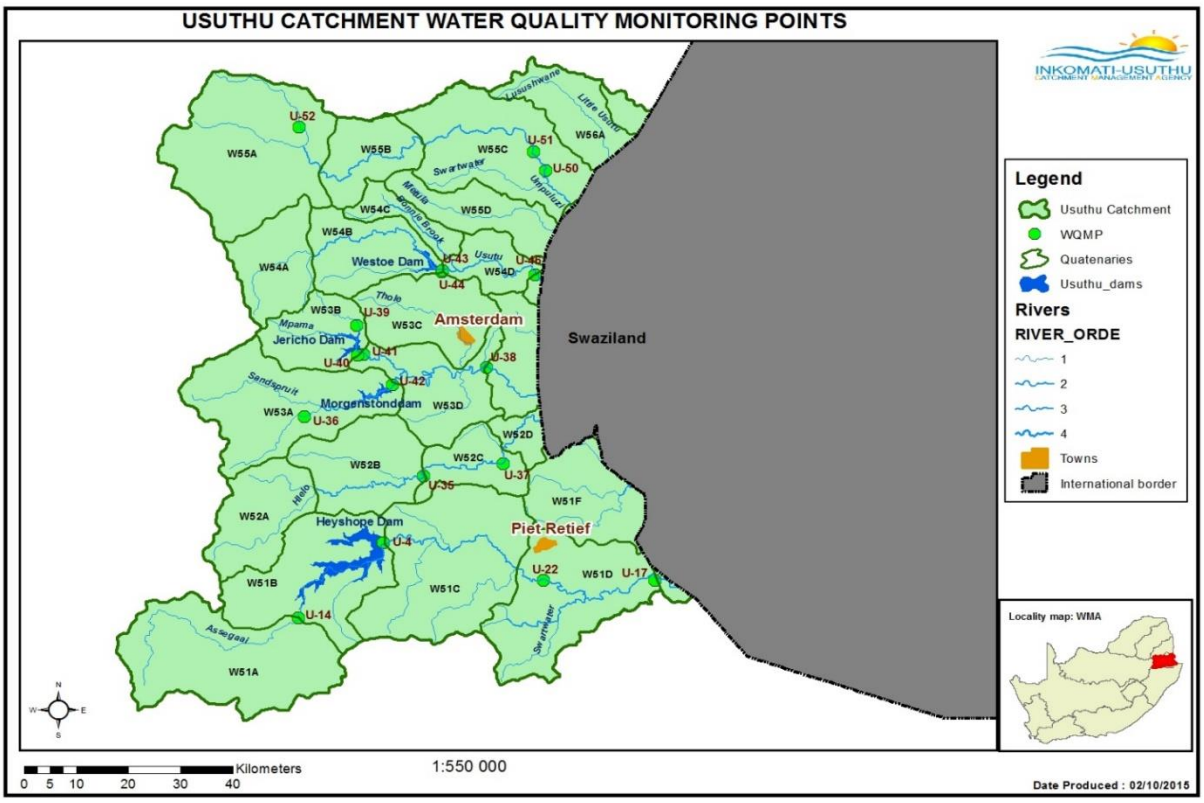


Figure 29: Map of the Usuthu River Catchment showing strategic monitoring points.

A total of 18 monitoring points were selected in the main stem of the Usuthu River and its tributaries. Three of the monitoring points were in the main stem of the Usuthu River from its headwaters until it enters Swaziland while the other 15 monitoring points were located in the Mpuluzi, Sandspruit, Hlelo and assegai which start at their sources and enter Swaziland independently of each other. Table 7 shows details of the location of selected monitoring points.

Table. 7 Usuthu Water Quality Monitoring Points

SITE NO.	SITE NAME	RIVER	CO-ORDINATES	
			LAT (S)	LONG (E)
U-4	Heyshope Dam Wall	Assegaai River	-26,99784	30,52464
U-14	Assegaai River Upstream of Heyshope Dam (Inflow)	Assegaai River	-27,13278	30,37806
U-17	Assegaai River at the Weir	Assegaai River	-27,06519	30,99356
U-22	Assegaai River After Confluence with Dorpspruit	Assegaai River	-27,06508	30,80131
U-35	Hlelo River on N2 Road Bridge to Ermelo	Hlelo River	-26.87690	30.59413
U-36	Ngwempisi River on N2 Road Bridge to Ermelo	Ngwempisi River	-26.76810	30.39331
U-37	Hlelo River on R33 Road Bridge to Amsterdam	Hlelo River	-26.85395	30.73167
U-38	Ngwempisi River on R33 Road Bridge to Amsterdam	Ngwempisi River	-26.67981	30.70253
U-39	Mpama River Upstream of Jerico Dam on R65 Road Bridge	Mpama River	-26.60438	30.47946
U-40	Mpama River Downstream of Jerico Dam	Mpama River	-26.65724	30.49123
U-41	Jerico Dam	Mpama River	-26.65794	30.48010
U-42	Morgenstond Dam	Mpama River	-26.71229	30.54005
U-43	Westoe Dam	Usuthu River	-26.50734	30.62566
U-44	Usuthu River Downstream of Westoe Dam on R33 Road Bridge	Usuthu River	-26.50544	30.62691
U-46	Usuthu River @ weir before Nerston Border Gate	Usuthu River	-26.51305	30.78632
U-50	Mpuluzi River Downstream of Mpuluzi Oxidation Ponds	Mpuluzi River	-26.32367	30.80501
U-51	Mpuluzi River Upstream of Mpuluzi Oxidation Ponds	Mpuluzi River	-26.29064	30.78377
U-52	Mpuluzi River on N17 Road Bridge	Mpuluzi River	-26.29769	30.50727

4.2 Water Quality Status

The samples were analysed by a SANAS-accredited laboratory. Since the Usuthu River does not have Interim Water Quality Objectives, the Target Water Quality Guidelines were used for comparison purposes to determine compliance with the most stringent objectives that protect the fitness for use for the most sensitive user. Table 8 below shows the target water quality guidelines for relevant variables of concern. As indicated elsewhere in this document, indicator variables were selected for the purposes of this report to demonstrate the status of water quality in the Usuthu Catchment.

Table 8: Target water quality guidelines for relevant variables of concern for the Usuthu River Catchment.

Variable	Target Water Quality Guide	Uniform Effluent Standards	
		General	Special
pH (pH Units)	6.5 - 8.5	5.5-9.5	5.5-7.5
Conductivity (mS/m	0 - 40	intake+75%;250	intake+15%;250
E. coli (cfu/100ml)	0	0	0
Ammonia (mg/l)	0 - 1.0	10	1.0
TDS (mg/l)	0 - 450	*	*
Soluble ortho-phosphate (mg/l)	0.005-0.025	*	1.0
Sulphate (mg/l)	0 - 200	*	*
Iron (mg/l)	0 - 0.1	*	0.3
Manganese (mg/l)	0 - 0.02	0.4	0.1
Nitrate & Nitrite (mg/l)	0 - 6	*	1.5
Sodium (mg/l)	0 - 70	intake + 90	intake + 50
Aluminum (mg/l)	0 - 0.15	*	*
Arsenic (mg/l)	0 - 0.01	0.5	0.1
Copper (mg/l)	0 - 0.2	1.0	0.02
Calcium (mg/l)	0-32	*	*

4.2.1. Water Quality Status of the Usuthu Catchment

The responsibility for managing this catchment was transferred to the IUCMA in May 2014 through a gazette. There was no associated budget and human resources that were transferred to the IUCMA to be able to start operating in the area. Consequently, arrangements were made for the KZN office to continue managing the area until the IUCMA received the required resources to start operating in the area. This involved the IUCMA developing an augmented structure to accommodate additional staff and starting a recruitment process to appoint such staff.

This process was unfortunately delayed by the moratorium that was instituted by the Department of Water and Sanitation due to the transfer of the sanitation functions from the Department of Human Settlement back to the Department of Water Affairs, which was applicable to all agencies of the Department of Water and Sanitation as well. It was only in March 2015 that the IUCMA was able to fill the positions for the Usuthu Catchment.

Meanwhile the KZN office of the Department of Water and Sanitation stopped conducting water quality monitoring in the Usuthu Catchment in April 2014. The results presented in this chapter will cover only February 2015 and were done after an agreement was reached with the KZN office to take the samples and let the IUCMA pay for them since the IUCMA did not have staff and also did not know the monitoring sites while the KZN office had staff but reportedly did not have the budget

for the area. The results for March have not been made available to the IUCMA even after repeatedly requesting for them form the KZN office of the Department of Water and Sanitation.

The table below shows the results for four monitoring sites focusing on the indicator variables. The results cannot be presented graphically to show trend since they show only one data set for the month of February 2015.

Table 9: The water quality results for Usuthu River for the month of February 2015.

Parameters	**U-4** (Heyshope Dam Wall)	**U-14** (Assegaai River Upstream of Heyshope Dam (Inflow))	**U-17** (Assegaai River at the Weir)	**U-22** (Assegaai River After Confluence with Dorpspruit).
Aluminium (mg/l)	1.04	0.011	0.124	13.0
Chloride (mg/l)	4.35	2.90	4.84	
Electrical conductivity (mS/m)	13.1	14.1	13.3	20.1
Iron (mg/l)	0.496	0.004	0.088	
Manganese (mg/l)	0.003	0.003		
Nitrite (mg/l)	0.2	0.2		
Nitrate (mg/l)	0.2	0.2		
Ammonia (mg/l)	0.1	0.1	0.1	2.60
Ortho phosphate (mg/l)	0.2	0.2	0.2	
pH (pH Units)	7.98	7.89	8.14	7.58
Sulphates (mg/l)	15.1	5	8.06	

It will also be noted that the results do not cover all the monitoring points listed in the table or depicted in the map above. This is because some of the monitoring points have been established newly by the IUCMA to determine the background water quality at the headwaters of each major resource for example. These monitoring points have been selected as strategic monitoring points that will be used for reporting purposes on the water quality status going forward.The results for February shows that the resource status at this point is very good.

CHAPTER 5: STATUS OF WASTEWATER TREATMENT WORKS

Bushbuckridge Local Municipality

Maviljane WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW has a design capacity of 0.86 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the disposal of waste into the oxidation ponds and the discharge of effluent into the Injaka Dam.
- The monthly effluent discharge qualities are shown in Tables 10 (a) & (b) below.

Table 10 (a): The quality of the sewage overflow recorded from April 2013 to January 2014

Substance Parameter	Limit	Maviljane ponds/Mapulaneng WWTW							
		Apr	Jun	Jul	Aug	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.8	9.2	7.6	7.5	6.9	9.5	**9.6**	6.3
EC (mS/m)	75	19.5	21.7	25.0	31.1	19.3	23.8	20.3	7.6
N (mg/l)	No limit	0.2	0.2	0.4	0.2	0.2	0.4	0.2	0.2
Ortho-Phosphate (mg/l)	1	0.6	0.6	**1.1**	**1.3**	0.8	1.8	0.6	<0.05
COD (mg/l)	75	**88**	**104**	68	**141**	**121**	**116**	**92**	<10
E. coli (counts per 100 ml)	0	0	2	15	0	**52**	**1**	**1**	0
NH3 (mg/l)	1	0.3	0.9	**3.0**	**5.4**	**1.6**	0.7	0.2	<0.2

Table 10 (b): Final overflow quality from February 2014 to March 2015

Substance Parameter	Limit	Maviljane ponds/Mapulaneng WWTW							
		Feb	Mar	April	May	Oct	Jan	Feb	Mar
pH	5.5-9.5	7,6	6,4	7,8	7,4	NM	8,11	7,57	7,53
EC (mS/m)	75	6,7	7,1	5,5	11,5	NR	14,4	4,55	21,4
N (mg/l)	No limit	0,2	0,2	0,2	O,3	<0.1	<0.1	<0.1	0,3
Ortho-Phosphate (mg/l)	1	0,05	0,05	0,05	0,05	<0.2	0,63	<0.2	1,4
COD (mg/l)	75	10	10	10	20				
E. coli (counts per 100 ml)	0	**83**	0	**10**	0	NR	0	**8**	0
NH3 (mg/l)	1	NR				<0.1	<0.1	<0.1	0,3

The above table indicates that final effluents Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those communities who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore unlawful. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Thulamahashe WWTW

- The type of process technology applied by the WWTW is an activated sludge and oxidation pond.
- The WWTW has a design capacity of 1.56 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant has been classified as a Class B (28/01/2004) in terms of regulation 2834.
- All process controllers and supervisors are classified but the classification certificates were not available on site.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Mutlumuvi River.
- The WWTW does not have an emergency dam.
- The monthly effluent discharge qualities are shown in Tables 11 (a) & (b) below.

Table 11 (a): Thulamahashe WWTW - Final effluent quality from April 2013 to January 2014

Substance Parameter	Limits	Thulamahashe WWTW						
		Apr	Jul	Aug	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.2	7.6	7.7	6.8	7.3	7.6	6.8
EC (mS/m)	75	44.7	47.8	59.2	42.0	37.3	58.1	39.0
NO_3 (mg/l)	No limit	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ortho-Phosphate (mg/l)	1	**1.8**	**1.9**	**1.9**	**1.6**	**1.4**	**2.4**	**1.3**
COD (mg/l)	75	**117**	**112**	**169**	**141**	**124**	**272**	**92**
E. coli (per 100 ml)	0	**170 000**	**580 000**	**14 000**	**1 100**	**4 700**	**6500**	**4200**
NH_3 (mg/l)	1	**18**	**20**	**16**	**14**	**11**	**19**	**10**

Table 11 (b): Thulamahashe WWTW - Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Thulamahashe WWTW												
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb
pH	5.5-9.5	7,6	6,7	7,7	7,5	6,5	7,3	7,2	7,4	7,35	8,02	7,7	7,43	6,74
EC (mS/m)	75	11	13,3	13,1	13,3	14,1	14,5	17,3	15,3	14,9	14,4	13,2	17,9	23,6
NO3 (mg/l)	No limit	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2					
Ortho-Phosphate (mg/l)	1	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	<0.2	<0.2	<0.2	<0.2	<0.2
COD (mg/l)	75	10	10	10	10	10	10	10	10	NM	<10	10	<10	<10
E. coli (counts per 100 ml)	0	**820**	**6000**	**5500**	**5800**	**2400**	**2900**	**230**	**210**	**4700**	**720**	**720000**	**16000**	**2800**
NH3 (mg/l)	1	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	<0.1	<0.1	<0.1	<0.1	<0.1

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore illegal. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Mkhuhlu WWTW

- The type of process technology applied by the WWTW is oxidation ponds and bio-filter.
- The WWTW has a design capacity of 1.56 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant has been classified as a Class B (28/01/2004) in terms of regulation 2834.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the unnamed stream.
- The monthly effluent discharge qualities are shown in Tables 12 (a) & (b) below.

The WWTW is equipped with an emergency dam/pond, but the emergency pond is not operated properly. The purpose of an emergency pond is to divert wastewater into it temporarily during breakdown periods, which should be no more than 72 hours, after which the waste is then channelled back into the treatment process. Once the wastewater is held in the emergency dam longer than it ought to be, it no longer serves the purpose of an emergency and becomes a normal operational process facility.

Table 12 (a): Mkhuhlu WWTW - Final effluent quality from April 2013 to January 2014

Substance Parameter	General Limit	Mkhuhlu WWTW					
		Jun	Jul	Aug	Oct	Nov	Dec
pH	5.5-9.5	7.4	7.3	7.4	6.8	7.5	7.6
EC (mS/m)	75	35.8	32.8	44.1	32.7	39.6	34.8
N (mg/l)	No limit	4.5	17	6.3	19	6.2	7.5
Ortho-Phosphate (mg/l)	1	**1.6**	**2.1**	**2.8**	**2.5**	**2.1**	**1.4**
COD (mg/l)	75	72	20	**90**	20	60	56
E. coli (per 100 ml)	0 count/ 100 ml	**5 800**	**17 000**	**24**	**580**	**17**	**20**
NH_3 (mg/l)	1	**6.9**	**2.1**	**13**	**0.5**	**5.3**	**2.1**

Table 12 (b): Mkhuhlu WWTW - Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Mkhuhlu WWTW								
		Feb	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,3	7,4	7,5	7,19	7,76	7,45	8,22	8,11	9,12
EC (mS/m)	75	29,3	36,7	33,6	36,5	31,7	36,5	29,2	47,7	27,5
N (mg/l)	No limit	12	7,4	2,8						
Ortho-Phosphate (mg/l)	1	**2,6**	**4,9**	**1,9**	**1,8**	**1,8**	**2,1**	0,61	0,22	**1,8**
COD (mg/l)	75	20	60	52	70	46	64	19	48	41
E. coli (counts per 100 ml)	0	**180**	**1200**	**880**	**1**	**13000**	**0**	**0**	**3100**	**0**
NH3 (mg/l)	1	0,3	**5,2**	**4,1**	**6,1**	**2,6**	**11**	**1,3**	<0.1	<0.1

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore illegal. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Hoxani WWTW

- The type of process technology applied by the WWTW is oxidation ponds and currently a septic tank system is in use.
- The WWTW has a design capacity of 0.69 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- There was no process controller at the plant.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Sabie River.
- The Municipality is in the process of decommissioning the oxidation ponds.

Manghwazi WWTW

- The type of process technology applied by the WWTW is a bio-disc system.
- The WWTW has a design capacity of 0.06 ML/day.
- The WWTW does not have a water use authorisation.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- There is no process controller at the WWTW.
- The plant is not in operation and it is not receiving sewage.

Acornhoek SAPS WWTW

- The type of treatment technology used is oxidation ponds.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant does not have a water use authorisation.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- There is a chlorination station in place; however, no chlorination equipment is installed.
- The WWTW is not discharging its final effluent; however, the ponds are full and there is a strong chance of overflow taking place.
- The ponds have overgrown with reeds.

Tintswalo WWTW

- The type of treatment technology used is activated sludge.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW has been refurbished and functioned well for a few months but currently the plant is not in a good state of repair.
- The humus tanks are not functional due to the failure of the recycling pumps.
- There is chlorination taking place.
- The plant is not authorised in terms of the provisions of the National Water Act.
- The plant does not have an emergency dam.
- The ICMA started monitoring the final effluent in January 2014.
- The monthly effluent discharge qualities are shown in Table 13 below.

Table 13 Tintswalo Hospital WWTW - Final effluent quality from January 2014 to March 2015

Substance Parameter	Limit	Tintswalo Hospital WWTW											
		Feb	April	May	Jun	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,6	7,9	7,6	7,2	7,4	7,9	7,1	8,15	6,96	7,18	7,34	7,54
EC (mS/m)	75	32,7	88,6	41,7	13,3	50,2	53,2	16,5	37,1	31,3	33,5	13,5	36
N (mg/l)	No limit	12	0,2	0,9	0,2	2,6	0,2						
Ortho-Phosphate (mg/l)	1	**1,5**	**4,1**	**1,6**	0,05	**2,6**	0,2	0,62	**1,8**	**1,7**	**1,4**	<0.2	2
COD (mg/l)	75	46	**304**	36	20	60	**76**	**130**	**94**	**171**	36	53	72
E. coli (counts per 100 ml)	0	**10000**	**12000**	**10000**		**3100**	**6100**	**12**	**152000**	**30000**	**27000**	**28**	**184**
NH3 (mg/l)	1	0,2	**32**	**11**	0,2	**17**	**30**	0,94	**18**	**13**	**8,7**	<0.1	**11**

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Dwarsloop WWTW

- The type of treatment technology used is a biological filtration system.
- The plant has a design capacity of 1.6 ML/day.
- The plant has an average inflow of 0.9 ML/day.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The humus tanks and bio-filters are not functional.
- There is chlorination taking place; however, it is not effective.
- The treatment plant discharges poor effluent quality (see Table) due to the bypass.
- The plant is currently undergoing refurbishment and upgrade. The refurbishment and upgrade is going to have a positive impact on the treatment process which will result in the production of good quality effluent.
- The upgrade includes the following:
    - Two more bio-filters.
    - Two digesters.
    - Sets of drying beds.
    - Two more humus tanks.
- The plant is not authorised; however, there has been an initiative by the Municipality to get the treatment plant authorised for water uses in terms of section 21 (g) and (f) of the National Water Act, 1998 (Act 36 of 1998).
- The monthly effluent discharge qualities are shown in Tables 14 (a) & (b) below.

Table: 14 (a): Final effluent quality from April 2013 to December 2013

Substance Parameter	Limit	Dwarsloop WWTW						
		Apr	Jun	Aug	Sep	Oct	Nov	Dec
pH	5.5-9.5	7.3	7.0	7.4	7.3	7.3	7.2	7.7
EC (mS/m)	40	35.7	**40.5**	**45.9**	**48.7**	**42.0**	37.9	34.3
N (mg/l)	0-6	0.2	0.2	0.2	0.2	0.2	0.4	0.2
Ortho-Phosphate (mg/l)	0.005-0.025	**0.8**	**0.2**	**1**	**1.1**	**1.6**	**1.8**	**1.4**
COD (mg/l)	0-10	**92**	**164**	**209**	**189**	**125**	**88**	**56**
E. coli (per 100 ml)	0	**330 000**	**170 000**	**870 000**	**1 000 000**	**2 000 000**	**170 000**	**370 000**
NH3 (mg/l)	0-1	**13**	**15**	**16**	**17**	**12**	**11**	**8.8**

Table 14 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Dwarsloop WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.7	7.2	7.6	7.3	6.6	7.3	7.1	7.7	7,1	8,15	6,96	7,18	7,24	7,54
EC (mS/m)	75	27.0	27.4	34.7	18.5	32.5	42.3	36.3	42.6	16,5	37,1	31,3	33,5	30,4	36
N (mg/l)	No limit	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ortho-Phosphate (mg/l)	1	1	0.9	0.05	0.06	0.2	1.7	1.2	2.3	0.62	1.8	1.7	1.4	0.2	2
COD (mg/l)	75	53	32	28	36	159	92	111	152	130	94	171	36	53	72
E. coli (counts per 100 ml)	0	490	490	18000	2200	1700	26000	5500	4100	12	152000	30000	27000	5100	184
NH3 (mg/l)	1	7.9	7.2	14	3.0	8.0	19	13	19	0.94	18	13	8.7	8.6	11

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Mbombela Local Municipality

Hazyview WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW has a design capacity of 0.7 ML/day.
- The plant has been classified as a Class C (11/06/2013) in terms of regulation 2834.
- The WWTW is authorised (Licence No. 24009902) to discharge treated effluent into the Sabie River.
- All process controllers are classified as Class 0.
- Inflow and outflow meters are working.
- The plant has two mixers and they were not functional.
- There was built-up scum at the clarifier.
- The WWTW does not have an emergency dam.
- The monthly effluent discharge quality is shown in Tables 15 (a) & (b) below.

Table 15 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Licence Limit	Hazyview WWTW							
		Apr	Jun	Jul	Aug	Oct	Nov	Dec	Jan
pH	5.5-9.5	6.6	6.8	7.0	4.8	6.7	7.9	7.0	4.1
Electrical Conductivity (mS/m)	70 mS/m	23.2	30.5	39.4	43.2	30.6	10.0	32.9	28.6
Nitrate/ Nitrite as Nitrogen (mg/l)	15 mg/l	3.8	14	**16**	**18**	**16**	0.2	**20**	13
Ortho-Phosphate (mg/l)	5.0 mg/l	0.4	2.4	3.7	4.0	2.8	<0.05	2.6	2.8
Chemical Oxygen Demand (mg/l)	65 mg/l after removal of algae	<10	<10	48	24	36	12	32	12
E. coli (per 100 ml)	0 per 100ml	0	0	0	**5**	**220**	**8**	**16**	**13**
Ammonia (free and saline) (mg/l)	3.0 mg/l	<0.2	<0.2	0.4	<0.2	0.9	<0.2	0.5	<0.2

Table 15 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Licence Limit	Hazyview WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.4	6	7.6	7.4	6.9	7.2	7.5	7.9	7,17	7,93	7,44	7,48	7,78	7,79
EC (mS/m)	70 mS/m	29,4	8.3	30.1	10.7	37.7	61	12	12.3	39,5	40,2	42,8	40,1	14,3	7,21
N (mg/l)	15 mg/l	12	0.4	**16**	0.3	0.1	4.3	0.5	0.4	3,5	1,9	0,38	10	<0.1	<0.1
Ortho-Phosphate (mg/l)	5.0 mg/l	2.6	0.05	2.9	0.05	0.8	4.3	0.05	0.05	3,6	2,6	0,86	3,6	<0.2	<0.2
COD (mg/l)	65 mg/l after removal of algae	32	10	10	**92**	24	12	48	-	36	-	37	-	-	-
E. coli (counts per 100 ml)	0 per 100ml	**180**	**580**	**330**	**460**	**200**	**120**	**82**	**110**	0	**39000**	0	0	**153**	**14**
NH3 (mg/l)	3.0 mg/l	0,3	0.2	0.2	0.4	0.2	15	0.2	0.2	0,69	1,5	2,3	<0.1	<0.1	<0.1
SS (mg/l)	25 mg/l	-	-	-	-	-	-	-	-	<3	4	9	<3	5	**35**

The above table indicates that nitrate/Nitrite and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. Nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

White River WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW has a design capacity of 6 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant has been classified as a Class B (02/07/2012) in terms of regulation 2834.
- The WWTW is authorised (Licence No. 24089442) to discharge treated effluent into the White River.
- Process controllers are all classified.
- The inflow meter was not working.
- The WWTW has an emergency dam.
- The monthly effluent discharge qualities are shown in Tables 16 (a) & (b) below.

Table 16 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Licence Limit	White River WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.7	7.1	7.1	8	7.6	7.2	7.7	7.5	7.8	7.6
EC (mS/m)	75 mS/m	39.4	**143**	**43.2**	**84**	**76.6**	**42.8**	**198**	39.1	48.8	45.5
Nitrate/Nitrite as Nitrogen (mg/l)	15	5.7	7.7	7.8	4.5	0.2	2.8	6.8	4.1	5.7	3.2
Ortho-Phosphate (mg/l)	1	1	**2.8**	0.1	0.1	**21**	0.05	0.6	0.2	**1.6**	3
COD (mg/l)	75	20	12	12	20	**96**	68	36	28	**88**	36
E. coli (per 100 ml)	0 count/ 100 ml	**6 500**	**120**	**76**	**150**	**180**	**2 000**	**75**	**80**	**72**	**2**
Ammonia (free and saline) (mg/l)	1	0.2	0.5	0.3	0.2	**23**	0.2	0.4	0.2	**5.5**	0.2

Table 16 (b): White River WWTW - Final effluent quality from February 2014 to March 2015

Substance Parameter	License Limit	White River WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	No v	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.8	8	7.2	6.4	5.5	7.2	7.6	7.2	6,68	7,8	7,31	7,54	7,26	7,98
EC (mS/m)	75 mS/m	60.7	41.9	29.8	38.3	52.8	55.8	43.1	42.8	42,8	43,1	60	54,7	8,84	62,6
N (mg/l)	15	4.4	3.7	7.1	5.5	11	5.9	3.5	2.90	15	13	<0.2	<0.2	<0.2	<0.2
Ortho-Phosphate (mg/l)	1	2.9	2	3.6	0.8	0.3	1.7	0.2	0.05	2,2	<0.2	17	0,57	<0.2	<0.2
COD (mg/l)	75	16	32	10	151	10	20	20	68	102	51	102	64	93	55
E. coli (counts per 100 ml)	0 count/ 100 ml	0	**32**	**2000**	**4**	0	**1600**	0	**2000**	**3850**	**8**	0	**4**	**350**	**112000**
NH3 (mg/l)	1	<0.2	3.8	0.2	0.2	0.2	0.2	0.2	0.2	1,1	0,16	29	20	<0.1	26
SS	25					1	1	14.4		11	15	41	14	19	10

The above table indicates that Ortho-Phosphates, COD and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Rocky's Drift WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW has a design capacity of 2 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant has been classified as a Class C (11/06/2012) in terms of regulation 2834.
- The WWTW is authorised (Licence No. 24009662) to discharge treated effluent into the Sand River.
- The process controllers are classified.
- The WWTW does not have an emergency dam.
- The monthly effluent discharge qualities are shown in Tables 17 (a) & (b) below.

Table 17 (a): Final effluent quality from April 2013 to January 2014

Parameter	Licence Limit	Rocky's Drift WWTW								
		Apr	May	Jun	Jul	Aug	Sep	Nov	Dec	Jan
pH	5.5-9.5	7.9	7.9	7.5	8.1	7.8	7.6	7.7	7.7	7.4
Electrical Conductivity (mS/m)	75 mS/m	29.2	33.3	35.1	35.6	62.1	38.3	34.3	37.9	32.1
Nitrate/ Nitrite as Nitrogen (mg/l)	15	0.2	0.4	0.7	0.2	0.2	0.2	0.2	0.2	0.2
Ortho-Phosphate (mg/l)	1	0.2	0.2	0.2	0.1	0.05	0.05	0.05	0.05	0.2
Chemical Oxygen Demand (mg/l)	75	44	12	10	10	16	20	12	28	**83**
E. coli (per 100 ml)	0 count/ 100 ml	0	0	0	0	0	0	**17**	**17**	**260**
Ammonia (free and saline) (mg/l)	1	0.3	**4.6**	0.3	0.2	0.2	0.2	0.2	0.2	0.3

Table 17 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Licence Limit	Rocky's Drift WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8	7.8	7.2	6.9	6.3	7.3	6.7	8	6,64	8,11	7,31	7,24	7,08	7,34
EC (mS/m)	75 mS/m	26.3	25.8	**85.6**	**92.7**	**102**	**138**	**155**	**247**	75	44,2	**122**	214	17,9	**176**
N (mg/l)	15	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	0,53	2,4	<0.2
Ortho-Phosphate (mg/l)	1	<0.05	<0.05	<0.05	<0.05	0.2	<0.05	<0.05	0.05	0,91	0,87	<0.2	<0.2	0,81	<0.2
COD (mg/l)	75	16	16	20	12	10	20	20	48		**81**	62	30	**76**	58
E. coli (counts per 100 ml)	0 count/ 100 ml	0	**1400**	**1300**	0	0	**100**	0	0	10	0	13	0	**1600**	0
NH3 (mg/l)	1	0.2	0.4	0.6	0.2	0.2	0.4	0.2	0.2	<0.1	<0.1	0,13	<0.1	**1,5**	<0.1
SS (mg/l)	25					2.8	3.2	14.8	10.4	41	NR	18	18	21	6

The above table indicates that EC, COD and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Kingstonvale WWTW

- The technology being used is a bio-filter and activated sludge system.
- The WWTW was commissioned in 1980 (first phase) and 1996 (second phase).
- The design capacity is 26 ML/day.
- The design capacity of the bio-filter system is 15 ML/day and that of the activated sludge system is 11 ML/day
- The WWTW has been classified as a Class B in terms of the requirements of regulation 2834.
- There are four process controllers and all of them are Class III.
- The plant discharges its effluent into the Crocodile River and the effluent discharge quality is shown in Table
- The plant has a water use authorisation issued in 2009.
- The monthly effluent discharge qualities are shown in Tables 18 (a) & (b) below.

Table 18 (a): Final effluent quality from April 2013 to January 2014

Parameter	Licence Limit	Kingstonvale WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.8	7.3	7.4	8.0	8.1	7.9	8.1	7.6	7.8	7.8
Electrical Conductivity (mS/m)	70–150 mS/m	70.9	85.4	81.2	85.6	83.8	74.1	68.7	81.4	62.6	70.9
Nitrate/ Nitrite as Nitrogen (mg/l)	15	0.9	2.6	0.3	8.6	0.9	9.9	13	15	15	0.9
Ortho-Phosphate (mg/l)	1	**5.5**	**1.8**	**4.1**	**2.9**	0.3	**4.2**	**2.8**	**4.4**	**2.5**	**5.5**
COD (mg/l)	75	**393**	44	**265**	**104**	68	24	64	32	28	393
E. coli (per 100 ml)	0 count/ 100 ml	**160 000**	**120 000**	**178 000**	**58 000**	**0**	**2 000**	**1 600**	**610**	**8 700**	**160 000**
NH3 (free and saline) (mg/l)	1	**16**	**14**	**15**	**7.3**	**7.6**	**1.7**	<0.2	**2.3**	<0.2	**16**

Table 18 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Licence Limit	Kingstonvale WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.6	7.7	7.3	7.1	7.2	7.3	7.5	7.9	7,29	7,8	7,56	7,58	7,8	8,07
EC (mS/m)	70–150 mS/m	62.8	65.7	67.2	72.7	78	76.2	80.2	75	70,8	68,9	67,4	55,9	15,7	68,4
N (mg/l)	15	8.9	15	**22**	**21**	**20**	**22**	**21**	15	**18**	**18**	**17**	5,6	<0.2	4,8
Ortho-Phosphate (mg/l)	1	**2.5**	0.8	**3.5**	**3.8**	0.5	**2**	**2.0**	**3.20**	**1,5**	**1,7**	**2,6**	**1,7**	<0.2	0,59
COD (mg/l)	75	36	24	16	28	16	12	12	32		28	45	24	89	29
E. coli (counts per 100 ml)	0 count/ 100 ml	**6500**	**5**	**1**	**16**	**910**	0	**28**	**23**	**1**	**2**	**4100**	0	**1700**	0
NH3 (mg/l)	1	**1.6**	0.2	**1.9**	0.2	**3.2**	**1.3**	0.2	0.30	0,17	<0.1	<0.1	**2,9**	<0.1	**3,9**
SS (mg/l)	25					10.4	3.6	9.6	8.4	3	3	**31**	4	**67**	5

The above table indicates that Ortho-Phosphates, Nitrate/Nitrite, Amonia and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Kanyamazane WWTW

- The technology being used is a parallel petro pond system.
- The WWTW was commissioned during 1972.
- The design capacity is 12 ML/day.
- The current operational capacity of the plant is 5 ML/day.
- The WWTW has been classified as a Class D in terms of the requirements of regulation 2834.
- The supervisor is a Cass IV.
- There are two permanent process controllers classified as Class I.
- The WWTW has a water use authorisation issued in 2009.
- The monthly effluent discharge qualities are shown in Tables 19 (a) and (b).

Table 19 (a): Final effluent quality from April 2013 to January 2014

Parameter	Licence Limit	Kanyamazane WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.9	7.7	7.1	8.0	8.0	7.4	7.9	7.4	7.8	7.5
Electrical Conductivity (mS/m)	75	48.5	58.9	57.2	59.1	62.8	59.8	55.0	53.3	55.0	51.9
Nitrate/ Nitrite as Nitrogen (mg/l)	15	**16**	11	13	4.5	**17**	**21**	**19**	**17**	**18**	14
Ortho-Phosphate (mg/l)	1	1.1	0.2	0.3	<0.2	1.9	0.5	1.8	1.5	<0.05	1.0
COD (mg/l)	75	20	32	67	32	48	32	20	16	16	28
E. coli (per 100 ml)	0	**4**	0	**12**	**11**	0	0	0	0	0	**4**
NH3 (free and saline) (mg/l)	6	2.7	**11**	**9.1**	**9.6**	**7.8**	2.7	0.5	0.5	0.7	1.8

Table 19 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Licence Limit	Kanyamazane WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.7	7.9	7.4	5.7	7.3	7	7.6	8	7,14	7,98	7,52	6,83	8,22	7,07
EC (mS/m)	75	41	44.9	44.2	58.9	**77.4**	60.4	59.1	55.80	62,4	56,9	62	43,8	15,1	53,1
N (mg/l)	15	**17**	**16**	**21**	0.1	**19**	13	**20**	**16.90**	13	**16**	0,67	19	0,49	**20**
Ortho-Phosphate (mg/l)	1	**4**	**2.7**	**3.3**	0.05	0.2	0.6	0.2	0.30	0,73	0,5	3,3	0,74	<0.2	0,26
COD (mg/l)	75	20	24	10	10	10	32	12	20	69	40	86	11	45	21
E. coli (counts per 100 ml)	0	**980**	**330**	**1800**	0	0	0	0	0	0	0	0	4000	**10000**	0
NH3 (mg/l)	6	0.2	0.2	0.2	0.8	**28**	**9.5**	3	1.30	**7,6**	3,4	**16**	<0.1	<0.1	0,3
SS (mg/l)	25	-	-	-	-	1.6	2.8	11.2	10	10	7	16	7	9	11

The above table indicates that EC, Ortho-Phosphates, Nitrates, Amonia and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Kabokweni WWTW

- The technology being used is activated sludge.
- The WWTW was commissioned in 2010.
- The design capacity is 3.4 ML/day.
- The current operational capacity of the plant is 2 ML/day.
- The plant is classified as Class E.
- The process controllers are classified as Classes IV and I.
- This WWTW water use authorisation was issued on the 3 June 2015.
- The effluent discharge qualities are shown in Tables 20 (a) & (b).

Table 20 (a): Final effluent quality from April 2013 to January 2014

Parameter	Licence Limit	Kabokweni WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-7.5	**8.0**	**8.3**	7.3	**8.4**	**8.1**	**7.7**	**7.9**	**7.8**	**8.0**	7.5
Electrical Conductivity (mS/m)	75 mS/m	42.2	48.5	56.7	55.4	71.9	65.3	56.8	55.9	48.8	44.9
Nitrate/ Nitrite as Nitrogen (mg/l)	1.5	0.6	1.4	0.8	0.3	<0.2	0.2	5.5	0.4	1.1	0.8
Ortho-Phosphate (mg/l)	1	0.4	0.3	<0.2	<0.2	**1.3**	**3.1**	**11**	<0.2	<0.05	<0.05
COD (mg/l)	75	16	12	24	24	36	36	48	32	28	28
E. coli (per 100 ml)	0	**26 000**		**55 000**	**5**	**10**	0	**110**	0	**6 900**	**13 000**
NH3 (free and saline) (mg/l)	1	0.4	**2.4**	**6.2**	0.3	**18**	**2.8**	1.2	0.3	<0.2	1.3

Table 20 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Kabokweni WWTW												
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.7	8.0	7.7	7.4	8.0	7.7	7.9	8.2	7.59	8.4	7.27	7.57	7.89	8.1
EC (mS/m)	75	42.7	46.1	53.8	52.9	65.9	68.2	83.0	87.2	22.5	56.6	59.9	51.3	39.9	53.7
Nitrate (mg/l)	1.5	0.9	3.7	0.5	<0.2	<0.2	0.5	0.2	<0.2	<0.2	0.68	<0.2	0.56	<0.2	<0.2
Ortho-Phosphate (mg/l)	1	0.9	9.3	<0.05	<0.05	0.6	0.4	<0.05	2.7	<0.2	<0.2	23	3	<0.2	0.33
COD (mg/l)	75	40	36	32	20	36	20	28	76		43	67	16	25	22
E. coli (counts per 100 ml)	0	16000	27	1900	0	160	1500	34	20	5460	0	3600	52000	0	1
NH3 (mg/l)	1	9.5	6.6	14	0.5	11	19	23	41	0.14	0.3	3	<0.1	<0.1	<0.1

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Matsulu WWTW

- The plant uses an activated sludge process.
- The plant was commissioned in 2001.
- The WWTW is authorised to discharge effluent into the Crocodile River**.**
- The authorisation was issued in 2009 and the effluent discharge quality is shown in Table
- The WWTW has been classified as a Class C in terms of the requirements of regulation 2834.
- The supervisor has been classified as a Class IV.
- The plant has a design capacity of 6 ML/ day and operates at a capacity of 3 ML/day.
- General housekeeping at the plant is satisfactory
- Discharged effluent is clear of debris and suspended solids.
- The WWTW does not have an emergency dam.
- The monthly effluent discharge qualities are shown in Tables 21 (a) & (b) below.

Table 21 (a): Final effluent quality from Jan 2014 to March 2015

Parameter	Licence Limit	2013								
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
pH	5.5-9.5	8.3	8.3	7.9	8.3	8.2	8.2	8.3	7.5	7.8
Electrical Conductivity (mS/m)	70 mS/m	56.0	56.2	55.5	57.6	62.6	59.4	54.0	56.6	49.4
Nitrate/ Nitrite as Nitrogen (mg/l)	15	8.1	10	12	11	9.7	8.3	5.9	6.8	7.2
Ortho-Phosphate (mg/l)	1	**2.3**	**2.3**	**3.2**	**2.9**	**1.9**	**1.1**	**1.0**	**1.2**	**3.1**
Chemical Oxygen Demand (mg/l)	75	12	<10	<10	20	12	16	12	<10	20
E. coli (per 100 ml)	0 count/100ml	0	0	0	0	**44**	**3**	0	0	0
Ammonia (free and saline) (mg/l)	3	<0.2	<0.2	**15**	0.2	0.2	0.3	0.2	0.2	<0.2

Table 21 (b): Final effluent quality from Jan 2014 to March 2015

Parameter	Licence Limit	2014											2015		
		Jan	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7.0	63	54.4	63	63.5	60.3	64.2	7.14	7.48	7.25	79.2	6.96	7.16	7.1
Electrical Conductivity (mS/m)	70 mS/m	54.7	**89**	6	22	0	10	0	67	62.5	74	227	81.6	79.4	58.6
Nitrate/ Nitrite as Nitrogen (mg/l)	15	6.7	7.8	7.57	7.4	7.26	7.52	8	1.0	0.40	0.30	7.10	0.50	0.20	0.8
Ortho-Phosphate (mg/l)	1		3	1	0.9	1.50	4.80	3.0	4.2	4.7	3.3	1.40	8.20	6.5	3.9
Chemical Oxygen Demand (mg/l)	75		4.9	4.4	3.9	2.80	3	3.6	117	21	102	7.0	248	307	13
E. coli (per 100 ml)	0 count/100ml	**1**	29.	36	26	5	10	5.00	**0**	**3**	**0**	446	0	0	**0**
Ammonia (free and saline) (mg/l)	3	0.2	58.9	50.3	42.8	23.3	0.70	0.70	21.4	0.70	0.4	2.10	1.70	11.9	0.20

The above table indicates that although the WWTW is compliant most of the time, there are times when Ortho-Phosphates, NH_3 and *E*. *coli* are not complying with the effluent discharge standards. Ortho-Phosphate did not comply for almost the whole duration of the reporting period. The plant had also been non complaint with the Electrical Conductivity and Chemical Oxygen Demand limits. Accumulation of sludge resulted in high elevation of the parameters mentioned. High PO_4 may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E*. *coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Nkomazi Local Municipality

Komatipoort WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW has a design capacity of 1.2 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- There were no process controllers on site. Currently the Municipality employed two process controllers.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Crocodile River.
- The monthly effluent discharge qualities are shown in Tables 22 (a) & (b) below.

Table 22 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	General Limit	Komatipoort WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	8.4	7	7.7	8.2	8.2	8.2	8.1	7.8	8	7.8
Electrical Conductivity (mS/m)	75 mS/m	**85.6**	**81.3**	**84.0**	**86.5**	**100**	**110**	**116**	**115**	**108**	**94.2**
Nitrate/ Nitrite as Nitrogen (mg/l)	No limit	0.1	0.2	0.2	05	0.2	0.2	0.5	0.2	0.2	0.1
Ortho-Phosphate (mg/l)	1	**3.8**	**3.4**	**3.2**	**3.7**	**3.4**	**2.4**	**4.6**	**3.9**	**2.8**	**2.9**
Chemical Oxygen Demand (mg/l)	75	32	12	24	36	24	28	36	52	48	67
E. coli (per 100 ml)	0 count/ 100 ml	**140**	**270**	**17 000**	**490**	**290**	**580**	**410**	**160**	**610**	**0**
Ammonia (free and saline) (mg/l)	1	**15**	**14**	**16**	**18**	**18**	**16**	**16**	**14**	**16**	**9.8**

Table 22 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Komatipoort WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8	Not Monitored	Not Monitored	7.7	7.7	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge	No Discharge
EC (mS/m)	75	74.3			**83.6**	**89.9**									
N (mg/l)	No limit	0.2			0.2	0.2									
Ortho-Phosphate (mg/l)	1	**2.5**			**2.6**	**2.7**									
COD (mg/l)	75	28			44	16									
E. coli (counts per 100 ml)	0	**1700**			**310**	**40**									
NH3 (mg/l)	1	**11**			**6**	**12**									

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore illegal. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Hectospruit WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW has a design capacity of 0.265 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Crocodile River.
- The monthly effluent discharge qualities are shown in Tables 23 (a) & (b) below

Table 23 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	General Limit	Hectorspruit WWTW								
		Apr	May	Jun	Jul	Aug	Sep	Nov	Dec	Jan
pH	5.5-9.5	8.2	8.4	8.1	8.3	7.9	7.9	8.1	7.9	7.9
Electrical Conductivity (mS/m)	75 mS/m	72	75.7	66.5	71.3	**85.5**	**86.7**	**80.3**	**78.4**	72.8
Nitrate/ Nitrite as Nitrogen (mg/l)	No limit	0.1	0.2	0.3	0.2	02	0.3	0.5	0.3	0.1
Ortho-Phosphate (mg/l)	1	**3.6**	**3.5**	**3.5**	**4.5**	**4.8**	**4.4**	**4**	**4.4**	**9.4**
Chemical Oxygen Demand (mg/l)	75	36	28	32	52	52	68	60	44	47
E. coli (per 100 ml)	0 count/ 100ml	**2**	0	0	**3**	0	0	**14**	**170**	**14**
Ammonia (free and saline) (mg/l)	1	0.2	0.2	0.4	**3.7**	**13**	**9.9**	**1.1**	**1.5**	**1.7**

Table 23 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Hectospruit WWTW											
		Feb	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8.6	8	7.6	8.1	8.3	7.90	7,67	7,83	8,63	7,58	7,99	8,19
EC (mS/m)	75 -250 mSm	71.4	64.6	60.1	80.9	76	84.40	85,4	86,8	82,5	67,7	214	72,7
N (mg/l)	No limit	<0.2	0.2	0.9	3.3	2.9	1.80	4,7	1,7	4,4	<0.2		
Ortho-Phosphate (mg/l)	1	**7.3**	**2.8**	**2.4**	**8.5**	**5.4**	**6**	**5,1**	**4,4**	**4,2**	**3,7**	**2,2**	**1,8**
COD (mg/l)	75	40	40	32	44	**175**	68	**91**	67	75	47	**205**	**137**
E. coli (counts per 100 ml)	0	**4**	**49**	**36**	**150**	**93**	**80**	0	0	0	**300**	**360**	0
NH3 (mg/l)	1	**2.1**	0.2	0.2	0.9	0.2	**1.40**	1	**1,9**	<0.1	0,5	<0.1	<0.1
SS (mg/l)	90			22	9.6	47	24	4	20	24	20	96	61

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore unlawfull. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Mhlathi Plaas WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW has a design capacity of 0.75 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Crocodile River.
- The monthly effluent discharge qualities are shown in Tables 24 (a) & (b).
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.

Table 24 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	General Limit	Mhlathi Plaas WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	8	7.9	8.1	7.8	8.2	8.4	8.3	8.1	8	7.4
Electrical Conductivity (mS/m)	75 mS/m	64.9	65.7	72.7	**81.8**	**86.9**	**89.2**	**80.6**	**82.7**	**76.9**	67.8
Nitrate/ Nitrite as Nitrogen (mg/l)	No limit	0.2	0.2	0.2	0.2	0.6	0.4	0.7	0.2	0.2	0.2
Ortho-Phosphate (mg/l)	1	**2.5**	**1.9**	**1.5**	**2.8**	**1.8**	**3.9**	**3.1**	**3.7**	**3.3**	**3.2**
Chemical Oxygen Demand (mg/l)	75	65	68	44	**104**	**112**	56	**104**	**87**	**104**	**166**
E. coli (per 100 ml)	0 count/ 100 ml	**31**	**3**	**5**	**2 400**	0	0	0	**2**	0	**46**
Ammonia (free and saline) (mg/l)	1	**14**	**13**	**16**	**21**	**16**	**16**	**12**	**13**	**13**	**11**

Table 24 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Mhlatiplaas WWTW												
		Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8.2	7.7	7.3	7.6	7.9	7.5	8.30	7,71	7,72	8,46	8,23	7,81	8,39
EC (mS/m)	75	50.7	65.8	65.6	72.7	**81.7**	**91.7**	**91.90**	**94,4**	**92,7**	**96,7**	70,9	45,2	74,4
N (mg/l)	No limit	0.2	0.4	0.6	0.2	0.2	0.7	0.30	8,3	0,25	<0.2	<0.2	1,6	<0.2
Ortho-Phosphate (mg/l)	1	1.9	2.3	1.6	2.5	22	2.6	3.10	**3,6**	**3,1**	**4,3**	**3,6**	2,7	3,4
COD (mg/l)	75	**104**	71	**123**	**73**	**84**	**60**	**100**	**158**	**146**	**107**	**131**	**210**	**138**
E. coli (counts per 100 ml)	0	0	0	0	0	**1**	0	0	0	0	**100**	0	0	0
NH3 (mg/l)	1	**6.5**	**11**	**7.9**	**13**	**15**	**13**	**12**	**17**	**17**	**19**	**6,2**	<0.1	**8,7**
SS (mg/l)	90				17.6	17.2	17.5	32	NR	39	13	36	43	28

The above table indicates that EC, Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Mhlathi Kop WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW has a design capacity of 1 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Crocodile River.
- An emergency dam is not available.
- The plant discharges partially treated effluent to the tributary of the Crocodile River.
- The plant is being refurbished.
- The monthly effluent discharge qualities are shown in Tables 25 (a) & (b) below.

Table 25 (a): Final effluent quality from April 2013 to September 2013

Substance Parameter	General Limit	Mhlathi Kop WWTW					
		Apr	May	Jun	Jul	Aug	Sep
pH	5.5-9.5	8	7.7	7.6	8.2	7.7	7.9
Electrical Conductivity (mS/m)	75 mS/m	54	68.7	68.6	75	**82.5**	**77.2**
Nitrate/ Nitrite as Nitrogen (mg/l)	No limit	0.1	0.2	0.4	1.1	0.8	0.7
Ortho-Phosphate (mg/l)	1	0.7	**3.3**	**1.9**	**1.9**	**4.1**	0.9
Chemical Oxygen Demand (mg/l)	75	52	72	**87**	**144**	**176**	68
E. coli (counts per 100 ml)	0 count/ 100ml	**30**	**93**	0	0	0	0
Ammonia (free and saline) (mg/l)	1	**12**	**22**	**19**	**22**	**21**	**20**

Table 25 (b): Final effluent quality from September 2013 to March 2015

Substance Parameter	Limit	Mhlati Kop WWTW															
		Oct	Nov	Dec	Jan	Feb	Mar	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8	7.4	7.8	7.5	8.50	8.40	7.9	8	7.4	7.40	7,39	6,18	8,32	7,24	8,07	8,2
EC (mS/m)	75	72.1	70	64.3	72.9	68.60	74.10	67.9	**86.1**	71.3	64.70	66,7	56,8	70,7	67,4	26,5	60,6
N (mg/l)	No limit	0.2	0.2	0.2	0.1	0,80	0.90	0.3	3.3	9.8	6.60	2,1	0,7	3,3	<0.2	<0.2	<0.2
Ortho-Phosphate (mg/l)	1	0.9	**3.3**	0.9	**4.1**	**2.20**	**1.70**	**2**	**3**	**4.1**	**1.70**	**2,1**	0,69	**1,6**	**2,6**	<0.2	**1,9**
COD (mg/l)	75	100	206	152	107	173	72	77	64	56	64	**130**	46	**98**	**178**	62	98
E. coli (counts per 100 ml)	0	**12 0000**	**17 000**	**25 000**	**160 000**	**0**	**2400**	0	**61**	**61**	**56**	0	0	0	**1100000**	**304**	0
NH3 (mg/l)	1	24	17	21	21	**19.00**	**12**	**18**	**18**	**11**	**5.20**	**7,1**	<0.1	**16**	**20**	<0.1	**7,3**
SS (mg/)	90	-	-	-	-	-	-	30	15.6	**145**	10.8	4	15	27	57	24	36

The above table indicates that EC, Ortho-Phosphates, *E. coli,* NH3 and SS did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Tonga Ponds WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW has a design capacity of 1.25 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices and it is still under refurbishment.
- The WWTW is a Class D in terms of the requirements of regulation 2834.
- The process controller on site is a Class V.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Komati River.
- The plant has been refurbished.
- The monthly effluent discharge qualities are shown in the Tables 26 (a) & (b) below.

Table 26 (a): Final overflow quality from April 2013 to January 2014

Substance Parameter	General Limit	Tonga Ponds WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	8.4	7.9	7.7	8.5	7.5	7.5	7.5	7.5	7.8	7.8
Electrical Conductivity (mS/m)	75 mS/m	**85.6**	63.6	**78**	**84.2**	**111**	63.2	69.6	69.6	38.6	**94.2**
Nitrate/ Nitrite as Nitrogen (mg/l)	No limit	0.2	0.2	0.2	0.9	0.2	0.2	0.2	0.2	0.2	0.2
Ortho-Phosphate (mg/l)	1	**2.4**	**1.5**	**1.8**	1.0	**2.7**	**1.4**	0.97	0.97	0.5	**2.9**
Chemical Oxygen Demand (mg/l)	75	30	12	36	55	**183**	24	36	36	39	67
E. coli (per 100 ml)	0 count/ 100ml	**140 000**	**170 000**	**20 000**	0	**170000**	**4 000**	**61 000**	**61 000**	0	**20 000**
Ammonia (free and saline) (mg/l)	1	**11**	**9.2**	**14**	**7.6**	**22**	**9.0**	**10**	**10**	**3.8**	**9.8**

Table 26 (b): Final overflow quality from Feb. 2014 to March 2015

Substance Parameter	General Limit	Tonga Ponds WWTW								
		Apr	May	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	8.4	8.2	8.3	8.3	8.3	8.03	8.09	8.26	8.15
Electrical Conductivity (mS/m)	75 mS/m	37.8	45.7	52.5	50.2	45.6	37.5	33.1	24.6	42
Nitrate/ Nitrite as Nitrogen (mg/l)	No limit	0.6	0.5	0.1	0.4	0.4	0.22	0.32	0.2	0.2
Ortho-Phosphate (mg/l)	1	0.05	0.05	0.05	0.05	0.05	0.2	0.2	0.2	0.2
Chemical Oxygen Demand (mg/l)	75	20	10	-	-	-	**96**	64	72	20
E. coli (per 100 ml)	0 count/ 100ml	**180**	**160**	**140**	**140**	**290**	**14950**	0	**21000**	**5280**
Ammonia (free and saline) (mg/l)	1	0.2	0.2	0.2	0.2	0.2	**24**	**13**	**25**	**7**

The above table indicates that final effluents Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those communities who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore unlawful. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Emakhazeni Local Municipality

Waterval Boven WWTW

- The type of process technology applied by the WWTW is activated sludge and bio-filters.
- The WWTW has a design capacity of 2.4 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant has been classified as a Class B (26/09/2012) in terms of regulation 2834.
- The WWTW is authorised (Licence No. 05/X21G/FG/1421) to discharge treated effluent into the Elands River.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The mechanical screen has been fixed and was functional.
- All the mixers were functional.
- The drying beds are not used and they were covered with grass/weeds.
- The trickling filter was not working.
- The humus tank was also not working.
- Housekeeping was poor, grass was overgrown and access to the whole plant was difficult.
- There was no disinfection of the final effluent taking place.
- The plant discharges untreated sewage into the Elands River and the monthly effluent discharge qualities are shown in Tables 27 (a) & (b).

Table 27 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Licence Limits in mg/l	Waterval Boven WWTW						
		Apr	May	Jun	Jul	Aug	Sep	Oct
pH	5.5 – 7.5	8.2	8.2	7.9	7.8	7.9	7.8	8.3
Electrical Conductivity	50 mS/m above intake to a maximum of 100 mS/m	32.4	29.3	31.0	34.0	30.5	30.4	30.7
Nitrate	1.5 mg/l	**3.4**	**4.8**	**3.6**	0.1	0.1	<0.2	<0.1
Free and saline ammonia (as N)	2 mg/l	<0.2	0.3	0.2	**4.6**	<0.2	0.3	<0.2
Chemical Oxygen Demand	30 mg/l	<10	<10	<10	20	16	<10	16
Ortho-Phosphate	(1 median and 2.5 max) mg/l	0.5	0.8	0.4	2.5	0.5	0.5	0.2
E. coli (counts per 100 ml)	0 mg/l	6 200	9 800	8 700		6 200	17 000	6 900

Table 27 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Licence Limits in mg/l	Waterval Boven WWTW														
		Nov	Dec	Jan	Feb	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5 – 7.5	7.9	8.0	6.9	7.8	6.9	7.0	7.4	7.2	7.70	7,2	7,54	8,33	7,58	7,92	7,73
EC (mS/m)	50 mS/m above intake to a maximum of 100 mS/m	31.9	33.1	32.5	27	33.9	35.4	29.9	29.9	32.80	37,5	35,9	36,2	36,9	16,5	35,3
N (mg/l)	1.5 mg/l	0.1	<0.1	0.5	**1.9**	**9.2**	0.6	0.3	**3**	**7**	**13**	**2,2**	**3,4**	**3,3**	<0.2	**5**
Ortho-Phosphate (mg/l)	(1 median and 2.5 max) mg/l	0.2	0.4	1,7	0.2	0.3	1.7	0.05	0.05	0.50	**1,6**	**2,3**	<0.2	**1,2**	<0.2	<0.2
COD (mg/l)	30 mg/l	<10	30	32	10	10	**173**	10	10	**44**	26	26	<10	13	29	**92**
E. coli (counts per 100 ml)	0	**3 900**	**13 000**	**16 00**	**20000**	**17000**	**5300**	**6000**	**12 000**	**16000**	**25200**	**119000**	**174**	**2960**	**96**	**60300**
NH3 (mg/l)	2 mg/l	<0.2	<0.2	**2.4**	0.2	0.2	7.7	0.6	0.5		**3,7**	**7,5**	<0.1	**6,2**	<0.1	<0.1
SS (mg/l)							180	1	4	42	13	5	4	<3	3	102

The above table indicates that Ortho-Phosphates, Nitrates, NH3 and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Emthonjeni WWTW

- The type of process technology applied by the WWTW is activated sludge and oxidation ponds.
- The WWTW has a design capacity of 1.5 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has a water use authorisation and the monthly effluent discharge qualities are shown in Tables 28 (a) & (b).
- The plant has been classified as a Class C (26/09/2012) in terms of regulation 2834.
- The WWTW discharges untreated treated sewage into the Leeuwspruit.
- Process controllers are all classified.
- The plant has an emergency dam.

Table 28 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Licence Limits in mg/l	Emthonjeni WWTW								
		Apr	May	Jun	Jul	Aug	Sep	Nov	Dec	Jan
pH	5.5 – 9.5	7.4	7.3	6.9	8.3	7.2	7.5	7.6	7.7	7.9
Electrical Conductivity	70 mS/m above intake to maximum of 150 mS/m	58.7	67.1	59.9	68.5	**76.7**	72.3	58.6	50.4	51.8
Nitrate	1 mg/l	0.1	<0.1	0.9	0.1	<0.1	0.2	<0.1	<0.1	0.3
Free & saline ammonia (as N)	1 mg/l	**23**	**31**	**16**	**31**	**35**	**30**	**21**	**15**	**20**
Chemical Oxygen Demand	30 mg/l	**129**	**173**	**873**	**72**	**192**	**199**	**119**	**96**	**111**
Ortho-Phosphate	1 mg/l	**3.1**	**3.7**	**8.8**	0.8	**4.3**	**4.2**	**2.8**	**1.9**	**2.4**
E. coli	0 mg/l		**220**	**98 000**				**110 000**	**1 700**	**1 300**

Table 28 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Licence Limits in mg/l	Emthonjeni WWTW											
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Dec	Feb	Mar
pH	5.5 – 9.5	7.6	7.9	7.3	5.5	7.5	7.2	7.4	7.90	8,01	8,17	7,75	7,37
EC (mS/m)	70 mS/m above intake to maximum of 150 mS/m	37.4	52.9	109	97.4	65.5	71	76.5	80.30	73,8	53,5	62,1	65,7
N (mg/l)	1 mg/l	**1.3**	0.2	**1.9**	0.1	0.2	0.2	0.2	0.30	**4,9**	<0.2	<0.2	<0.2
Ortho-Phosphate (mg/l)	1 mg/l	**2.8**	**2.1**	**11**	**11**	**3.4**	**3.5**	**3.8**	**4**	**4**	**1,7**	0,4	**3,4**
COD (mg/l)	30 mg/l	**56**	**161**	**55**	**71**	**231**	**167**	**270**	**280**	**250**	**124**	NR	**197**
E. coli (counts per 100 ml)	0 mg/l	**490**	**390**	**10**	**470**	**6**	**310**	**110**	**77**	0	**50**	0	**540000**
NH3 (mg/l)	1mg/l	**14**	**19**	**47**	**14**	**30**	**32**	**39**	**38**	**27**	**17**	**18**	**28**

The above table indicates that Nitrates, Ortho-Phosphates, COD, NH3 and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Chief Albert Luthuli Local Municipality

Ekulindeni WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW design capacity is estimated to be around 2.5-3 ML/day.
- The average daily flow (operational) capacity is unknown as the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The WWTW does not have a water use authorisation for the use of their treatment system.
- The WWTW does not have process controller on site; only security personnel are on site.
- The plant has a total of 9 oxidation ponds, with only 4 currently in use.
- The plant has 2 screens in series.
- The first screen is poorly maintained and located in a residential area.
- The WWTW is not discharging.

Carolina WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW has a design capacity of 2.5 ML/day.
- The average daily flow (operational) capacity is unknown.
- The plant has been classified as a Class E (9/10/2012) in terms of regulation 2834.
- Screenings are not properly disposed of.
- The WWTW does not have a water use authorisation for the discharge of effluent into the tributary of the Boesmanspruit River.
- The monthly effluent discharge qualities are shown in Tables 29 (a) & (b).
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- An emergency dam is not available on site.

Table 29 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Limits in mg/l	Carolina WWTW								
		May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5–9.5	8.2	7.2	7.9	7.5	7.4	6.9	7.1	6.7	7.9
Electrical Conductivity	75 mS/m	57.9	54.2	48.8	50.6	71.2	44.3	58.3	37.5	49.9
Nitrate	No limit	0.7	19	7.9	1.0	<0.2	6.3	1.4	10	15
Ortho-Phosphate	1 mg/l	**2.2**	0.8	0.9	0.6	**4.0**	**1.6**	**15**	0.2	**1.1**
Chemical Oxygen Demand	75 mg/l	75	51	44	67	**267**	56	48	67	28
E. coli	0 mg/l	**580**	0	**22**	**130 000**	**200 000**	**160 000**	**130 000**	**42**	**23**
Free and saline ammonia (as N)	1 mg/l	**20**	**9.3**	**8.2**	**12**	**31**	**4.9**	**12**	0.2	<0.2

Table 29 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Carolina WWTW												
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Mar
pH	5.5-9.5	7	7	7	7,7	7,1	7,4	7	6,8	7,14	7,5	6,62	7,16	7,34
EC (mS/m)	75 mS/m	52,9	52,9	49,6	59,4	51,8	74,9	55,9	59,4	57,1	53,4	46,1	50,8	68,7
N (mg/l)	No limit													
Ortho-Phosphate (mg/l)	1	**4,3**	0,4	**4**	**3**	0,3	**2,5**	**1,9**	**2,3**	0,58	<0.2	0,67	**2,5**	**2,1**
COD (mg/l)	75	57	28	48	56	44	60	24	36	**118**	32	NR	52	**88**
E. coli (counts per 100 ml)	0	**1**	**2000**	**1600**	**490**	**410**	**980**	**1000**	**240**	**1150**	**330**	**26600**	**273000**	**28200**
NH3 (mg/l)	1	0,1	0,2		**15**	0,2	**28**	0,2	0,2	**3,5**	**3,1**	<0.1	**15**	**26**

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Badplaas Ponds WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW's design capacity is 2.4 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW has a general authorisation.
- Pond 1 is full of scum. The WWTW is not fenced which allows livestock (cows) to access the WWTW and drink from the ponds.
- There is currently no discharge and the last 4 ponds are still empty.

Elukwatini WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW's design capacity is 2.5 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- Inlet screens were full of screenings.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Tee River.
- The discharge point is not accessible due to the overgrown grass and weeds.
- The monthly effluent discharge qualities are shown in Table 30 below.

Table 30: Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Elukwatini WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,4	7	7,1	7,5	7,1	7,2	7,1	6,8	7,22	7,44	6,84	7,18	8,17	8,01
EC (mS/m)	75	45,2	43,1	42,8	45,6	38,9	39,96	40,1	36,3	50,3	51,6	45	41	33,1	19,4
N (mg/l)	No limit														
Ortho-Phosphate (mg/l)	1	**2,2**	**1,6**	**1,8**	**1,3**	**1,2**	**1,4**	**2,3**	**1,9**	**3,1**	**3,8**	**3,8**	**2,4**	<0.2	<0.2
COD (mg/l)	75	**243**	**761**	52	**760**	52	**468**	40	52	69	31	NR	NR	**852**	11
E. coli (counts per 100 ml)	0	**43**	**140**	**170**	**490**	**140**	**500**	**13**	**1200**	**128**	**80**	**1**	**2340**	**96**	**16000**
NH3 (mg/l)	1	**7,1**	0,9	0,2	**3,9**	**2,9**	**1**	**4**	**2,2**	**13**	**13**	<0.1	**5,4**	<0.1	**1,9**

The above table indicates that final effluents Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those communities who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore unlawful. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

UMJINDI LOCAL MUNICIPALITY

Umjindi WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW's design capacity is 8.4 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The plant has been classified as a Class B (27/08/2012) in terms of regulation 2834.
- The WWTW has a water use authorisation for the discharge of effluent into an unknown stream.
- The WWTW does not have an emergency dam.
- All process controllers are classified.
- The plant uses one manual screen and the mechanical screen has been broken since January 2013.
- The plant also uses 2 aerators instead of 12, and 1 clarifier instead of 4.
- The WWTW discharges partially treated sewage with floating sludge into the environment.
- The WWTW is in the processes of refurbishment.
- The WWTW has no emergency dam.
- The monthly effluent discharge qualities are shown in Tables 31 (a) & (b) below.

Table 31 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	WUL Limits	Umjindi WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.6	7.6	7.3	7.7	7.6	7.8	8.4	7.6	7.7	7.5
Electrical Conductivity	70 mSm	70.1	78.4	**85.6**	**81.5**	**88**	**80.8**	**58.7**	**84.2**	68.9	**77.9**
Nitrate	No limit	<0.1	0.1	<0.1	<0.1	<0.1	0.3	0.8	<0.1	<0.1	<0.1
Free and saline ammonia (asN)	15 mg/l	**37**	**38**	**52**	**47**	**48**	**45**	15	**36**	**25**	**44**
Chemical Oxygen Demand	75 mg/l	56	**96**	**135**	**176**	**104**	**116**	32	**135**	**112**	**91**
Ortho-Phosphate	6 mg/l	0.9	4.9	5.3	5.1	5.8	4.6	0.3	**7.3**	2.9	4.2
E. coli	0 mg/l	**2 000 000**	**260**	**<1 000 000**	**300**	**<2 000 000**	**980**	**0**	**1 600**	**150**	**120 000**

Table 31 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Umjindi WWTW												
		Feb	Mar	April	May	Jun	Jul	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8,3	7,4	7,4	7,7	7,5	7,8	8,3	7,82	6,52	8,24	7,24	8,07	8,25
EC (mS/m)	70	67	**83,8**	**77,7**	**85**	**88**	**88,4**	**74,1**	45,5	6,3	65,7	66,9	42,5	**81,4**
N (mg/l)	No limits													
Ortho-Phosphate (mg/l)	6 mg/l	4,1	5,1	4,5	4,7	5,7	5,9	3,8	0,27	5,1	4,8	<0.2	<0.2	14
COD (mg/l)	75	**97**	**120**	67	**87**	**157**	**80**	**104**	**92**	59	56	39	23	39
E. coli (counts per 100 ml)	0	**1700000**	**1000000**	**1400000**	**2400000**	**530000**	**1000000**	**1000000**	0	0	0	0	**200**	**245000**
Free and saline ammonia (asN)	15 mg/l	**35**	**41**	**46**	**47**	**56**	**53**	**44**	1,8	2	8,5	**17**	<0.1	**39**

The above table indicates that EC, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

THABA CHWEU LOCAL MUNICIPALITY

Sabie WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW's design capacity is 2.0 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Sabie River.
- The monthly effluent discharge qualities are shown in Tables 32 (a) & (b).
- An emergency dam is not available.

Table 32 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	General Limit	Sabie WWTW							
		Apr	Jun	Jul	Aug	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.8	7.4	8.0	7.2	7.1	7.2	7.2	7.1
Electrical Conductivity (mS/m)	75 mS/m	36.4	43.1	35.4	44.7	32.5	35.0	20.8	20.0
Nitrate/Nitrite as Nitrogen (mg/l)	No limit	<0.2	0.2	<0.2	<0.2	5.3	4.2	3.9	4.5
Ortho-Phosphate (mg/l)	1	**1.6**	**1.7**	**1.4**	**1.8**	**1.7**	**1.7**	0.5	0.9
Chemical Oxygen Demand (mg/l)	75	48	60	64	**90**	40	**147**	32	<10
E. coli (per 100 ml)	0 count/ 100 ml	**6 000 000**	**330 000**	**36 000**	**15 000**	**7 700**	**17 300**	**120**	**110**
Ammonia (free and saline) (mg/l)	1	**15**	**14**	**12**	**15**	**2.3**	**2.8**	**0.6**	**1.3**

Table 32 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Sabie WWTW												
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,3	7,7	8,1	7	7,1	7,3	7,3	7,7	7,21	8,22	7,62	6,95	7,22	7,29
EC (mS/m)	75	30,5	26,2	10,5	36,5	40	47,2	41,6	44,6	38,5	62,4	45,7	36,6	45,9	43,9
N (mg/l)	No limit														
Ortho-Phosphate (mg/l)	1	**2**	0,8	0,05	**1,8**	**2,3**	**2,9**	**1,8**	**1,6**	0,71	**1,8**	**2,6**	**1,2**	**3**	**2,5**
COD (mg/l)	75	-	-	-	-	-	-	-	-	NR	NR	NR	NR	NR	NS
E. coli (counts per 100 ml)	0	**4900**	**200000**	**170000**	**14000**	**42000**	**180**	**24000**	**40000**	**2**	**46800**	**50000**	**0**	**0**	**2430**
NH3 (mg/l)	1	**8,9**	**6,6**	0,2	**4,1**	**8,2**	**12**	**7,8**	**14**	**6,3**	**11**	**9,2**	**4,3**	**17**	**10**

The above table indicates that Ortho-Phosphates, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Graskop WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW has a design capacity of 1 ML/day.
- The average daily flow (operational) capacity is 1.2 ML/day.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The monthly effluent discharge qualities are shown in Table 33 (a) & (b).
- The WWTW does not have a water use authorisation.
- The treatment plant has a crack on the walls of the aeration tank which results in partially treated sewage leaking out of the aeration tank.
- The overflow is contained in an emergency pond.

Table 33 (a): Final effluent quality from April 2013 to December 2014

Substance Parameter	General Limit	Graskop WWTW						
		Apr	Jun	Aug	Sep	Oct	Nov	Dec
pH	5.5-9.5	8.2	7.4	7.1	7.3	7.2	7.4	7.4
Electrical Conductivity (mS/m)	40 mS/m	**40.3**	**42.3**	**40.8**	**49.5**	**42.6**	36.3	26.3
Nitrate/ Nitrite as Nitrogen (mg/l)	0-6	<0.2	0.2	<0.2	0.2	0.2	0.2	0.2
Ortho-Phosphate (mg/l)	0.005-0.025	**2.8**	**2.9**	**2.6**	**3.0**	**2.8**	**2.2**	**1.2**
Chemical Oxygen Demand (mg/l)	0-10	**414**	**148**	**177**	**185**	**117**	**52**	**84**
E. coli (per 100 ml)	0 count/ 100 ml	**770**	**190**	**460**	**580**	**920**	**69**	**160**
Ammonia (free and saline) (mg/l)	0-1	**21**	**22**	**19**	**24**	**21**	**14**	**7.7**

Table 33 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Graskop WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	8.0	7.8	7.2	7.2	7.6	7.2	6.8	8.2	7.22	8.05	7.73	7.08	7.22	7.21
EC (mS/m)	75	22	32.9	34.9	3.5	40.7	45.1	38.4	19.9	8.92	44.3	39.4	37.3	45.9	43.5
N (mg/l)	No limit	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ortho-Phosphate (mg/l)	1	1.5	2.3	2.4	1.8	2.7	3.1	0.7	0.4	0.2	1.7	1.3	1.1	3	3.3
COD (mg/l)	75	32	73	66	40	60	112	151	24	0.2	1.7	1.3	1.1	0.2	
E. coli (counts per 100 ml)	0	1600	0	5	3	1	12	1200	19000	180	0	16800	0	0	0
NH3 (mg/l)	1	9.9	15	18	15	22	25	2.8	31	0.33	20	23	12	17	20

The above table indicates that Ortho-Phosphates, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource. It must also be mentioned that the activated sludge treatment system have ability to produce final effluent which is within discharge standards if operated accordingly. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

MSUKALIGWA LOCAL MUNICIPALITY

Breyten WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW has a design capacity of 0.65 ML/day.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the unnamed stream.

DEPARTMENT OF PUBLIC WORKS

Oshoek Border Gate WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The monthly effluent discharge qualities are shown in Table 34 below.
- An emergency dam is not available.

Table 34: Final effluent quality from October 2014 to March 2015

Substance Parameter	Limit	Oshoek WWTW					
		Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7	7,78	6,6	7,55	7,94	7,8
EC (mS/m)	75	53	37,3	34,7	31,1	20,8	53
N (mg/l)	No limit	NR	0,98	<0.2	0,69	NR	<0.2
Ortho-Phosphate (mg/l)	1	**5,5**	<0.2	<0.2	**4,9**	NR	**1,5**
COD (mg/l)	75	55	25	**107**	17	39	71
E. coli (counts per 100 ml)	0	**60**	**380**	**26100**	**5600**	NR	**16000**
NH3 (mg/l)	1	<0.1	**1,3**	<0.1	0,11	NR	**16**
SS (mg/l)	90	4	4	**100**	8	7	23

The above table indicates that Ortho-Phosphates and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Lebombo Border Gate WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834/17 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The monthly effluent discharge qualities are shown in Table 35 below.
- The Department of Public Works has appointed Mamli Projects to operate the plant.
- An emergency dam is not available.

Table 35: Final effluent quality from October 2014 to March 2015

Substance Parameter	Limit	Lebombo WWTW					
		Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,32	No Discharge	7,53	No Discharge	7,55	7,38
EC (mS/m)	75	**119**		128		40,4	95,3
N (mg/l)	No limit	56		17		1,8	27
Ortho-Phosphate (mg/l)	1	12		9,8		<0.2	7,4
COD (mg/l)	75	NM		32		28	39
E. coli (counts per 100 ml)	0	0		0		0	**32**
NH3 (mg/l)	1	16		43		<0.1	13

The above table indicates that Ortho-Phosphates and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Loiueville WWTW

- The type of process technology applied by the WWTW is a bio-filtration system.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The monthly effluent discharge qualities are shown in Table 36 below.
- The plant is operated by Repinga Consulting and only operates a day shift.
- An emergency dam is not available.

Table 36: Final effluent quality from October 2014 to March 2015

Substance Parameter	Limit	Louieville WWTW		
		Oct	Jan	Feb
pH	5.5-9.5	8,36	7,59	7.88
EC (mS/m)	75	155	**80,8**	99.00
N (mg/l)	No limit	<0.2	0,2	0.02
Ortho-Phosphate (mg/l)	1	6,9	<0.2	2,10
COD (mg/l)	75	82	28	38
E. coli (counts per 100 ml)	0	0	**840000**	**320000**
NH3 (mg/l)	1	85	**19**	**18**

The above table indicates that Ortho-Phosphates and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Tonga Hospital WWTW

- The type of process technology applied by the WWTW is activated sludge.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The monthly effluent discharge qualities are shown in Table 37 (a) & (b) below.

Table 37 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Limits in mg/l	Tonga Hospital WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.9	7.5	7.7	8.2	7.7	7.7	7.4	7.6	7.8	7.6
Electrical Conductivity	75 mS/m	38.4	52.0	58.9	**75.4**	73.4	50.3	49.0	41.3	69.3	38.5
Nitrate	No limit	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2
Ortho-Phosphate	1 mg/l	0.8	0.5	0.5	0.7	0.7	0.6	0.51	0.6	**1.1**	0.6
Chemical Oxygen Demand	75 mg/l	28	<10	**93**	47	**78**	36	24	36	55	39
E. coli	0 mg/l	**2 000**	**20 000**	**20 000**	**1 700**	**200 000**	**200 000**	**160 000**	**83**	**2 700**	**10 000**
Free and saline ammonia (as N)	1 mg/l	**6.0**	**5.8**	**4.1**	**7.1**	**7.4**	**5.6**	**4.8**	**4.6**	**7.6**	**6.2**

Table 37 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Tonga Hospital WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,7	7.5	7.6	7.4	6.5	7.7	7.5	8.1	7,23	6,59	8,44	7,44	8,23	7,72
EC (mS/m)	75	48,3	36.6	36.7	56.2	35.6	63.7	71.7	60.3	57,4	62,5	69,9	60,5	43,5	61,7
N (mg/l)	No limit	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	9,4	<0.2	<0.2	<0.2
Ortho-Phosphate (mg/l)	1	0,5	0.5	0.5	0.5	0.3	0.7	0.7	0.84	1,2	0,9	0,57	1	0,36	**1,3**
COD (mg/l)	75	28	28	24	24	28	28	52	32	**90**	**136**	43	30	34	45
E. coli (counts per 100 ml)	0	**120000**	**20000**	**1700**	**570**	**310**	**550**	**380**	**290**	**100000**	**387000**	**26400**	**1800**	**105**	**72000**
NH3 (mg/l)	1	**5.4**	**5.4**	**7.2**	**5.3**	**3.8**	**7.9**	**6.6**	**7.9**	**14**	**11**	<0.1	**4,9**	<0.1	**9,4**

The above table indicates that Ortho-Phosphates, COD, NH3 and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Bongani Hospital WWTW

- The type of process technology applied by the WWTW bio-filtration system.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The plant is operated by New Business Networks.

Barberton Prison WWTW

- The type of system used is a bio-filter system.
- The WWTW has a design capacity of 3 ML/day and it is mostly operated at 2.6 ML/day.
- There is no authorisation for the operation of this WWTW.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- There is no monitoring at the WWTW which is undertaken by the IUCMA.
- An emergency dam is not available.

Shongwe Hospital WWTW

- The type of process technology applied by the WWTW is a septic tanks and bio-filtration system.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The monthly effluent discharge qualities are shown in Tables 38 (a) & (b).
- The plant is operated by New Business Networks.
- An emergency dam is not available.

Table 38 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	Limits in mg/l	Shongwe Hospital WWTW									
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-9.5	7.3	7.4	7.5	7.8	7.3	7.3	7.3	7.7	7.7	7.1
Electrical Conductivity	75 mSm	27.3	26.7	29.8	30.6	31.4	30.1	19.9	24.5	23.6	26.3
Nitrate	No limit	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ortho-Phosphate	1 mg/l	0.5	1.0	0.7	0.7	**1.3**	**1.2**	0.37	0.6	0.5	**1.7**
Chemical Oxygen Demand	75 mg/l	**83**	56	56	**134**	**149**	56	48	44	71	**173**
E. coli	0 mg/l	**16 000**	**5 200**	**4 400**	**7 300**	**20 000**	**20 000**	**20 000**	**3 600**	**61 000**	**160 000**
Free and saline ammonia (as N)	1 mg/l	**6.3**	**9.0**	**7.4**	**8.8**	**11**	**9.7**	**4.4**	**5.5**	**4.4**	**11**

Table 38 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Shongwe Hospital WWTW									
		Feb	Mar	April	May	Jun	Jul	Nov	Dec	Jan	Mar
pH	5.5-9.5	7,6	7.7	7.8	7.6	7.3	7.7	6,89	8,59	7,03	7,94
EC (mS/m)	75	25,9	31.3	30.5	27	22.2	35.7	25,7	31,2	28,9	42
N (mg/l)	No limit	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1,3	<0.2
Ortho-Phosphate (mg/l)	1	1	0.8	1	0.4	0.6	**1.2**	**1,6**	**1,1**	0,89	**2**
COD (mg/l)	75	64	48	60	**137**	36	44	**78**	**76**	55	**95**
E. coli (counts per 100 ml)	0	**4400**	**3600**	**1200**	**530**	**350**	**1200**	**153000**	**45000**	**35000**	**560000**
NH3 (mg/l)	1	**8.2**	**6.5**	**9.7**	**6.5**	**5.4**	**13**	**12**	**12**	0,44	9,8

The above table indicates that Ortho-Phosphates, COD, NH3 and *E. coli* did not comply with the effluent discharge standards for most of the time during the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

PRIVATELY-OWNED WWTW

Badplaas Aventura Ponds WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Buffelspruit.

Naas Plaza WWTW

- The type of process technology applied by the WWTW is the Lilliput system.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.

Acornhoek Plaza WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into an unknown stream.
- The monthly effluent discharge qualities are shown in Table 39 below.

Table 39: Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Acornhoek Plaza WWTW													
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,6	7,7	7,6	7,4	7,3	7,5	7,1	7,9	7,45	8,2	7,15	7,08	7,83	7,45
EC (mS/m)	75	54,7	64,4	31,6	**76,3**	**81,8**	**105**	**80,7**	**76,4**	**88**	**88,5**	**100**	**180**	**89,8**	**88**
N (mg/l)	No limit														
Ortho-Phosphate (mg/l)	1										**4,7**	**4,4**	**5,5**	**5**	<0.2
COD (mg/l)	75	**168**	**919**	**266**	16	**247**	**363**	**480**	**393**	**393**					
E. coli (counts per 100 ml)	0	**130000**	**1000000**	**510000**	**1400000**	**1700000**	**1000000**	**2000000**	**2400000**	0	**504000**	**477000**	**16000**	**200**	0
NH3 (mg/l)	1	-	-	-	-	-	-	-	-	**27**	**32**	**44**	**25**	<0.1	**27**

The above table indicates that Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource. It must also be mentioned that oxidation ponds are not designed to discharge, so the release of effluent into the receiving water resources is regarded as an overflow and is therefore illegal. It is not surprising that the quality of the overflow is not compliant. The treatment system is not effective enough to treat effluent to the level acceptable for discharge into the water resource.

Millys WWTW

- The type of process technology applied by the WWTW is rotating biological contactors.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Elands River.
- The monthly effluent discharge qualities are shown in Tables 40 (a) & (b) below.
- An emergency dam is not available.

Table 40 (a): Final effluent quality from April 2013 to January 2014

Substance Parameter	General Limit	Milly's WWTW								
		Apr	May	Jul	Aug	Sep	Oct	Nov	Dec	Jan
pH	5.5-7.5	5.1	7.4	7.8	7.5	8	7.4	6.7	7	6.8
Electrical Conductivity (mS/m)	50 mS/m	**76.8**	**111**	**122**	**117**	**120**	**86.5**	**75.7**	**69.6**	**90.3**
Nitrate/Nitrite as Nitrogen (mg/l)	1.5	**53**	**56**	**3.6**	**55**	**38**	**48**	**43**	**44**	**35**
Ortho-Phosphate (mg/l)	1	**8.7**	**9.4**	**12**	**13**	**9.3**	**9.8**	**7.4**	**5.9**	**11**
Chemical Oxygen Demand (mg/l)	30	**52**	**149**	**72**	**96**	**84**	**96**	**79**	**68**	**67**
E. coli (per 100 ml)	0 count/100 ml	**2 400**	**20 000**	**9 200**	**0**	**0**	**2 000**	**1 700**	**1 300**	**1 700**
Ammonia (free and saline) (mg/l)	2	**12**	**45**	**51**	**40**	**30**	**23**	**20**	**16**	**15**

Table 40 (b): Final effluent quality from February 2014 to March 2015

Substance Parameter	Limit	Milly's WWTW												
		Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
pH	5.5-9.5	7,20	6,50	7,30	5,50	6,30	6,90	6,90	7,90	7,78	7,82	7,34	6,48	6,79	7,31
EC (mS/m)	75	**95,60**	**75,80**	**110,00**	**97,40**	**123,00**	**123,00**	**110,00**	**111,00**	**180**	**119**	**79,7**	66	**83,8**	**97,2**
N (mg/l)	No limit														
Ortho-Phosphate (mg/l)	1	**11,00**	**9,10**	**10,00**	**11,00**	**16,00**	**14,00**	**13,00**	**12,00**	**46**	**13**	**8,3**	**9,1**	**9,2**	**9,4**
COD (mg/l)	75	69	60	51	71	**77**	56	71	72	**274**	**136**	**79**	70	61	69
E. coli (counts per 100 ml)	0	**2000**	**1100**	**1300**	**470**	**220**	**440**	**1600**	**530**	0	0	0	0	0	0
NH3 (mg/l)	1	**9,90**	**9,70**	**47,00**	**14,00**	**44,00**	**47,00**	**36,00**	**44,00**	**133**	**54**	**22**	**17**	**13**	**31**

The above table indicates that EC, Ortho-Phosphates, COD, NH_3 and *E. coli* did not comply with the effluent discharge standards for most of the variables and throughout the reporting period. High PO_4 and nitrates may contribute to nutrients which could result in eutrophication and the water not being fit for use. High *E. coli* is a threat for crop production, especially those crops eaten raw, and may also lead to waterborne diseases for those people who use water directly from the resource.

Kruger Park Lodge WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown however the lodge has initiated means to ensure that the inflow is known by installing the flow meter device.
- The WWTW has not been registered in terms of the requirements of regulation 2834/17 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and there are no process controllers or operators employed by the lodge.
- The WWTW does not have a water use authorisation; however, steps to become authorised are being taken by the lodge.

Protea Hotel Kruger Gate WWTW

- The type of process technology applied by the WWTW is septic tank with biological disc.
- The WWTW's design capacity is not known.
- The average daily flow (operational) capacity is unknown because the plant does not have flow measuring devices.
- The WWTW has not been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is not known.
- The copies of the process controllers' and supervisor's classification certificates were not available at the WWTW and therefore could not be verified.
- The WWTW does not have a water use authorisation for the discharge of effluent into the Sabie River.

Kruger National Park

Lower Sabie Rest Camp WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW design capacity is unknown.
- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

Skukuza Rest Camp WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW design capacity is unknown.
- The WWTW has a general authorisation (01 April 2009) for the discharge of water containing waste into a water resource.
- The WWTW has been registered in terms of the requirements of regulation 2834/17 and therefore the class of the plant is Class D.
- The WWTW is authorised through General Authorisation.

Berg-en-dal Rest Camp WWTW

- The type of process technology applied by the WWTW is oxidation ponds.
- The WWTW design capacity is unknown.
- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

Crocodile Rest Camp WWTW

- The type of process technology applied by the WWTW is septic tanks and reed beds.
- The WWTW design capacity is unknown.
- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

Talamati Rest Camp WWTW

- The type of process technology applied by the WWTW is reed beds.
- The WWTW design capacity is unknown.
- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

Biyamiti Rest Camp WWTW

- The type of process technology applied by the WWTW is reed beds.
- The WWTW design capacity is unknown.
- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

Pretorius Kop Rest Camp WWTW

- The type of process technology applied by the WWTW is oxidation ponds and reed beds.
- The WWTW design capacity is unknown.

- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

Orpen Rest Camp WWTW

- The type of process technology applied by the WWTW is reed beds.
- The WWTW design capacity is unknown.
- The WWTW has been registered in terms of the requirements of regulation 2834 and therefore the class of the plant is Class E.
- The WWTW is authorised through General Authorisation.

CHAPTER 6: WHAT IS BEING DONE ABOUT THE SITUATION?

The IUCMA is a responsible authority within the jurisdiction of the Inkomati Usuthu Water Management Area. As an authority, the IUCMA is responsible for managing, controlling, protecting and monitoring water resources in its area of responsibility. To achieve these broad goals, the IUCMA performs a number of activities or functions, such as:

- Monitoring the chemical and microbial quality of water resources.
- Monitoring the discharge qualities of all facilities discharging effluent into the water resources.
- Conducting river health monitoring.
- Attending to pollution incidents to ensure the proper clean-up of affected areas and minimisation of impact on both ground and surface water resources.
- Preventing pollution by ensuring that appropriate measures are put in place during construction, commissioning and operation of various developments through the water use authorisation, as well as co-authorisation through the Environmental Impact Assessment (EIA) and Environmental Management Programme (EMP) processes.
- Conducting regular inspections of land-based activities that have potential to impact on water resources such as mines, Waste Water Treatment Works, industries and other facilities.
- Conducting compliance, monitoring and enforcement through notices and directives. Depending on the response or non-response of the water user, the laying of criminal charges may also be considered.

To expatiate on the process of enforcing compliance, it must be mentioned that the ICMA as a public body is subject to various pieces of legislations. Particularly relevant and important for this chapter of the report is the Promotion of Administrative Justice Act. Equally important is the Inter-Governmental Relations Framework Act, which promotes co-operative governance between government institutions. To comply with the provisions of both pieces of legislation, the following working procedure is currently being utilised by the ICMA and is shown below, step-by-step:

6.1 Pollution Prevention and Remedying the Effects of Pollution in terms of Section 19 of the National Water Act No 36 of 1998 (NWA)

Step 1: During a site inspection an activity or a process is observed which causes, has caused or is likely to cause pollution.

Step 2: A notice of intention to issue a directive is then issued in terms of section 19(3) of the NWA. The notice must contain the following:

- The logo of the organisation and the address.
- A heading indicating the contravention.
- The delegated authority for issuing the notice.
- A clear indication of the section of the NWA against which the intended directive is to be issued.
- A clear indication of the sections of the NWA that have been contravened.
- The reasonable grounds for believing that the NWA has been contravened.
- Details of the inspection conducted and the findings of such inspection.
- Laboratory results, if any.
- Provision for the person issued with the notice to make representation in terms of section 3 of the Promotion of Administrative Justice Act, Act No 3 of 2000 (PAJA) within a certain time frame (not less than two days).

- A clear indication of what the intended directive will require the person to do, thus allowing the person issued with the notice to take necessary action even before the directive is issued. If issues are addressed adequately during this step, there may be no need for a directive to be issued.
- An alert to the person issued with the notice that failure to make representation will leave the IUCMA with no other option but to issue the directive.
- An indication that failure to comply with a directive constitutes an offence in terms of section 151(1) and that in terms of section 151(2) anyone who is found guilty of an offence is liable to a fine and/or imprisonment.
- The contact person and the address where the reports and any other correspondence must be submitted.

Step 3: Once the person issued with the notice makes representation, the representation is then assessed to determine if it is addressing the issues raised in the notice satisfactorily. If the representation addresses the issues satisfactorily, then the directive is not issued; however, if the representation is not addressing the issues raised adequately, the next step is followed.

Step 4: Before a directive is issued, a letter is issued to indicate to the person that the IUCMA is rejecting the representation because the representation is not adequately addressing the issues that were raised in the notice and thus the IUCMA will proceed to issue a directive.

Step 5: A directive will be issued which must be in the following format:

- The logo of the organisation and the address.
- A heading indicating the contravention.
- Reasons for issuing the directive, which must include:
    - The section of the NWA against which the directive is issued
    - The section of the NWA which has been contravened
    - Details of the pre-directive or notice of intention to issue a directive that was issued
    - Details of the representation that was received
    - Reasons provided by the IUCMA as to why the representation could not be accepted, and any other correspondence**.**
- The directive:
    - The delegated authority.
    - The section of the NWA against which the person is directed.
    - A clear description of what the person is directed to do and the time frames.
    - The contact person and the address where the reports and any other correspondence must be submitted.
- The implication of not complying with the directive, which may include:
    - Legal action that may be taken against the person.
    - The necessary steps taken by the IUCMA in terms of section 19(4) of the NWA.
    - The cost that may be recovered from the person in terms of section 19(5).
    - An indication that failing to comply with a directive constitutes an offence in terms of section 151(1) and that in terms of section 151(2) anyone who is found guilty of an offence is liable for a fine and/or imprisonment.
- The appeal process:
    - An indication to the person that in the absence of a constituted Water Tribunal, they may in terms of section 150 of the NWA make a request to the Minister of Water and Sanitation that this dispute be settled through a process of mediation and negotiation. Furthermore, in terms of section 148(2) of the NWA, the mediation process does not suspend the directive pending the outcome of such mediation.
    - The contact details of the person to engage with on the mediation process.

6.2 Control of Emergency Incidents in terms of Section 20 of the NWA

A pre-directive or a notice of intention to issue a directive is not required because one is dealing with an emergency, and the delay may cause irreversible damage to the water resource. This directive is issued to confirm a verbal directive already issued on site.

Step 1: A pollution incident is reported or identified during an inspection.

Step 2: A site investigation is conducted to determine the extent of the incident. While on site, a verbal directive is issued in terms of section 20(4)(d) of the NWA and the verbal directive must be confirmed in writing within 14 days in terms of section 20(5), failing which it will be deemed to have been withdrawn. The format and structure of section 20 of the NWA Directive is as follows:

- The logo of the organisation and the address.
- A heading indicating the contravention.
- Reasons for issuing the directive.
    - The section of the NWA against which the directive is issued.
    - Details of the pollution incident (date, time, area, river/stream, catchment, and the substance that has spilled).
    - Details of the verbal directive that was issued.
    - Details of the site visit conducted after the incident was reported.
- The directive:
    - The delegated authority.
    - The section of the NWA against which the person is directed.
    - A clear description of what the person is directed to do and the time frames.
    - The contact person and the address where the reports and any other correspondence must be submitted.
- The implication of not complying with the directive, which may include:
    - Legal action that may be taken against the person.
    - The necessary steps taken by the Department in terms of section 20(6) of the NWA.
    - The cost that may be recovered from the person in terms of section 20(7) read with section 20(2).
    - An indication that failing to comply with a directive constitutes an offence in terms of section 151(1) and that in terms of section 151(2) anyone who is found guilty of an offence is liable to a fine and/or imprisonment.
- The appeal process:
    - An indication to the person that in the absence of a constituted Water Tribunal, they may in terms of section 150 of the NWA may make a request to the Minister of Water and Sanitation that this dispute be settled through a process of mediation and negotiation. Furthermore, in terms of section 148(2) of the NWA, the mediation process does not suspend the directive pending the outcome of such mediation.
    - The contact details of the person to engage with on the mediation process.

6.3 Criminal Charges against a Polluter

Section 151 of the NWA provides a list of offences, and states that:

(1) No person may -
(d) fail to comply with a directive issued under section **19, 20**, 53 or 118;

(i) unlawfully and intentionally or negligently commit any act or omission that pollutes or is likely to pollute a water resource;
(j) unlawfully and intentionally or negligently commit any act or omission that detrimentally affects or is likely to affect a water resource;

Any person who contravenes any provision of subsection (1) is guilty of an offence and is liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years, or to both a fine and such imprisonment.

The laying of criminal charges is regarded as the last resort. All options must be exhausted before criminal charges against a particular polluter are considered. This includes the possibility of the ICMA taking corrective measures and claiming compensation from the polluter through an appropriate court in terms of section 19(5) and 20(7) of the NWA. This option is often not feasible because the ICMA does not budget to undertake the operation and maintenance of other institutions like mines and municipalities. The ICMA will therefore be obliged to consider the last option due to the other options being unfeasible and unable to yield positive results.

The table below shows the efforts exerted by the ICMA to address the water quality challenges that have been identified in the earlier chapters of this report. The efforts were made in pursuit of protecting water resources in order to achieve fitness for use by all in the Water Management Area and to meet international obligations entered into with neighbouring countries.

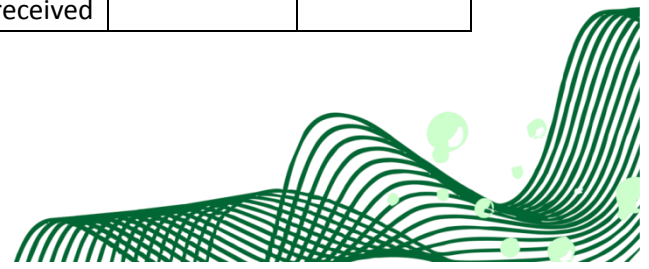
Table 41: The status of notices and directives to remedy pollution and rectify contraventions

No	Activity	Notices	Directives	Feedback to Directive	Case open	Comments	Resolved/ not resolved	Name of Official responsible
Mbombela Local Municipality								
1	For discharging partially treated wastewater at White River WWTW.	26 September 2013	24 June 2014	18 March 2015		A follow-up inspection was conducted on the 14 May 2014 at White River WWTW and it was observed that the WWTW was discharging partially treated sewage with foam into the White River. A directive dated 24 June 2014 was issued and a representation dated 14 July 2014 was received. A feedback letter dated 17 October 2014 was issued stating that the IUCMA accepts the Municipality's representation and that follow-up inspections would be conducted quarterly to ascertain whether the municipality is adhering to	Not Resolved	Fairbridge Mnisi / Manty Mashaba

						the measures stated in their representation. A follow-up inspection was conducted on the 06 March 2015 and it was observed that the drying beds were not in used due to the weeds overgrown and they are using emergency dam for desludging. A courtesy letter dated 18 Mach 2015 was issued to the MLM stating that the IUCMA will proceed to open a criminal case against the MM of MLM. A follow-up inspection was conducted on the 13 May 2015 and it was observed that the WWTW was discharging partially treated sewage.		

						The IUCMA will proceed to open a criminal case against the MM of MLM.		
2	For failing to prevent pollution due to partially treated wastewater being discharged at Tekwane North WWTW	30 June 2014				An inspection was conducted on the 12 June 2014 and it was observed that the WWTW discharges partially treated sewage and there are no monitoring taking place. Representation was received and accessed and a letter sent on the 14 October 2014. Sembcorp Silulumanzi was given 14 working days to respond to the concerns raised by the IUCMA. Representation was received on the 07 November 2014. Sembcorp Silulumanzi was given 14 working days to submit an action plan with timeframes for implementation. Letter was sent on the 21 January 2015.	Not Resolved	Bongiwe Sambo

						Representation was received on the 12 February 2015 and it addressed all the issues raised. IUCMA will conduct quarterly inspections. Action plan was submitted and commitment made to implement the action plan. Follow up inspections will be conducted to ascertain if the action plan is being implemented accordingly.		
3	For failing to prevent pollution due to partially treated wastewater being discharged at Rocky's Drift WWTW	26 June 2014	17 March 2015			An inspection was conducted on the 12 June 2014 and it was observed that the WWTW discharges partially treated sewage into the unnamed stream which is a tributary of Sand River. Representations dated 14 July 2014was received. Representations dated 22 October 2014 was received	Not Resolved	Fairbridge Mnisi



						and still under consideration. A feedback letter dated 17 October 2014 was issued stating that the ICMA accept their representations and that a follow-up inspection will be conducted quarterly to ascertain whether they are adhering to the measures stated. A feedback letter dated 17 October 2014 was issued stating that the IUCMA accepts the Municipality's representation and that follow-up inspections would be conducted quarterly to ascertain whether the municipality is adhering to the measures stated in their representation. A follow-up inspection was conducted on the 06 March 2015 and it was observed that the WWTW discharges		

						partially treated sewage into the stream. A directive dated 17 March 2015 was issued to the MLM. A follow up inspection was conducted in June and the feedback letter dated 30 June 2015 issued.		
4	For failing to prevent pollution due to pump station overflow at Kabokweni Ridge and Bhejukufa Pump Stations		16 September 2014	20 January 2015		An inspection was conducted on the 03 September 2014 and the verbal directive was issued onsite. A follow-up inspection was conducted on the 29 October 2014 and it was observed that the Pump Stations was not fixed. A follow-up inspection was conducted on the 29 November 2014.	Not Resolved	Fairbridge Mnisi / Thabo Rasiuba

						A courtesy letter dated 20 January 2015 was issued notifying the Municipal Manager that the IUCMA will proceed to open a criminal case. According to the municipality a contractor has been appointed to fix the broken sewer line. A follow up inspection will be conducted in the second quarter to check the progress on the repairs to the sewer line.		
5	For failing to prevent pollution due to partially treated wastewater being discharged at Kingston vale WWTW	3 December 2014				An inspection was conducted on the 29 October 2014 and it was observed that the WWTW discharges partially treated sewage into the Crocodile River. A notice of intention to issue a directive dated 3 December 2014 was issued	Not Resolved	Fairbridge Mnisi / Rofhiwa Ramunenyiwa

						to Sembcorp Silulumanzi. A representations was dated 19 December 2015 was received from the Sembcorp Silulumnzi. A feedback letter was dated 26 January 2015 was issued to the Semborp Silulumanzi stating that the representations is unsatisfactory pending the additional information requested and that the IUCMA will conduct follow-up inspections. A follow-up inspection was conducted on the 13 May 2015 and during the inspection it was observed that the outflow meter was not working. A compliance audit was		

						conducted on the 23 June 2015, to ascertain whether the MLM is complying with the license conditions. During the audit it was observed that the MLM is not complying with the discharge variables. Following a compliance audit a notice of intention in terms of section 53 (1)(c) of the NWA was issued dated 30 June 2015.		
6	For failing to prevent pollution due to partially treated wastewater being discharged at Hazyview WWTW	31 March 2014	03 September 2014			An inspection was conducted on the 19 March 2014 and it was observed that the WWTW discharges partially treated sewage into the Sabie River. A follow-up inspection was conducted on the 29 August 2014 and the wwtw was still discharging partially treated sewage into the Sabie River. .	Not Resolved	Bongiwe Sambo

						Another follow up inspection was conducted on the 17 October 2014. There was no electricity and the wwtw does not have a standby generator. Another inspection was conducted on the 21 November 2014 and the WWTW was still discharging partially treated sewage into the Sabie River. A feedback letter was sent to the municipality dated 21 January 2015. There are a few improvements on the plant. The fissure on red bed 2 has been repaired and the water quality results for the final effluent has improved significantly. The only outstanding issue was the disposal of sludge from the drying beds. The MLM has been given 30 working days		

						to submit an action plan regarding the disposal of sludge. Plan has been submitted and sludge is classified. This matter is considered resolved pending the follow up inspection which will be conducted in the first month of the second quarter.		
7	For failing to prevent pollution due to manhole overflow 500 m above the Telkom Pump Station, Hazyview	10 December 2014				An inspection was conducted on the 04 December 2014 and it was observed that raw sewage was overflowing on the street and into the tributary of the Sabie River and a notice dated 10 December 2014 was issued. Follow up inspection was conducted on 20 February 2015. The manhole has been repaired.	Resolved	Bongiwe Sambo
Thaba Chweu Local Municipality								
1	For failing to prevent pollution due to partially	19 June 2013	11 December			A follow-up inspection was conducted on the 13 June	Resolved	Golden

	treated wastewater being discharged at Graskop WWTW.		2014			2014 and it was observed that the sewage discharge into the emergency dam was not resolve and the inspection letter will be drafted and forwarded to the municipality. Another follow up inspection was conducted on the 25 November 2014 and a directive dated 11 December 2014 was issued. Another follow up inspection was conducted on the 12 June 2015 and it was observed that the crack between the mixer and aeration basin has been fixed. An inspection report was issued. Quarterly routine inspections will be conducted.		Mthembi
2	For failing to prevent pollution due to partially treated wastewater at	05 July 2013	31 October 2013	19 March 2014		A follow up inspection was conducted on the 04 April 2014.During the inspection it	Not resolved	Fairbridge Mnisi / Adolph

	Sabie WWTW					was observed that electricity has been restored, housekeeping has improved. Another follow-up inspection was conducted on the 17 June 2014, and it was observed that the motor from the clarifier was removed for repairs and the clarifier was covered with sludge. Another follow-up inspection was conducted on the 04 July 2014 it was observed that the clarifier was not functioning. Another follow up inspection was conducted on the 17 July 2014 it was observed that the clarifier was functional, however was still covered with sludge.		Mbetse / Golden Mthembi

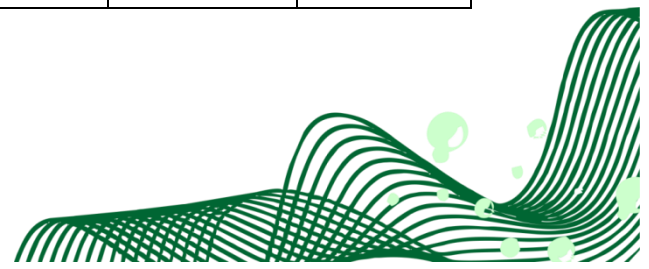
						Another follow-up inspection was conducted on the 28 August 2014. Another follow-up inspection was conducted on the 17 October 2014 and it was observed that the clarifier was covered with sludge. A letter dated 17 November 2014 was issued to Municipal Manager regarding the cleaning of the clarifier and disposing of sludge. Another follow-up inspection was conducted on the 6 March 2015 and the clarifier was still not functioning. The IUCMA will proceed to open a criminal case against the TCLM.		

						A follow inspection was conducted on the 11 June 2015, and it was observed that the WWTW mechanical screen was not working and the clarifier was covered with sludge. A feedback letter dated 29 June 2015 was issued to the Acting MM to apply for the water use authorization.		
Bushbuckridge Local Municipality								
1	For failing to prevent pollution due to partially treated wastewater discharged at Maviljane WWTW	24 May 2013	13 January 2014	14 April 2014	127/08/2014	A notice dated 24 May 2013 was issued for the discharge of partially treated sewage into the Injaka dam. A follow-up inspection was conducted on the 27 November 2013 and a directive dated 13 January 2014 was issued for the discharge of partially treated sewage into the Injaka dam.	Not Resolved	Fairbridge Mnisi

						A follow-up inspection was conducted on the 18 March 2014 a courtesy letter dated 14 April 2014 was issued notifying to the Municipality that the IUCMA will proceed to open a criminal case. Criminal case was opened A criminal case was opened on the 13 August 2014. A follow-up inspection was conducted on the 28 August 2014 with SAPS official and the contractor was onsite. A temporary wall was constructed to stop the discharge of partially treated sewage into the Injaka Dam. A follow-up inspection was conducted on the 10 October 2014 and it was		

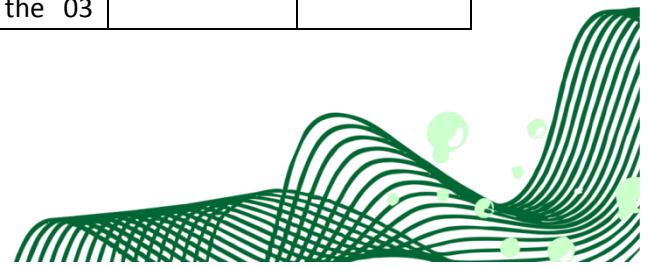
						observed that the there was no discharge of partially treated sewage into the Injaka Dam. A follow-up inspection was conducted on the 29 May 2015 and it was observed that the ponds were full of water hyacinth and weeds and HTH is used to disinfect the final overflow into the Injaka Dam. The IUCMA will arrange a meeting between SAPS and NPA to ensure that the case is placed on the roll for prosecution.		
2	For failing to prevent pollution due to overflowing septic tanks in Hoxani.	26 September 2013	24 June 2014	16 September 2014		An inspection was conducted on the 27 August 2013 and a notice dated was issued to the Municipality for the overflow of septic tank into the environment.	Not resolved	Fairbridge Mnisi

						A follow-up inspection was conducted on the 06 May 2014 at Hoxani WWTW and it was observed that the gate was lock and the official from BLM did not have the key. The WWTW was not visible due to grass that has overgrown in the WWTW and a directive dated 24 June 2014 was issued. A follow-up inspection was conducted on the 29 August 2014 and there was sewage overflow from septic tank into the environment. A courtesy letter dated 16 September 2014 was issued to the Administrator of BLM stating that the IUCMA will proceed to open criminal		



						case. A follow-up inspection was conducted on the 25 November 2014 and the BLM has done nothing to fix the situation. A statement will be drafted to open a criminal case against the MM of BLM.		
3	For failing to prevent pollution due to non-functional Thulamahashe WWTW	26 September 2013	09 December 2013		89/02/2014	An inspection was conducted at Thulamahashe WWTW on the 15 August 2013 and it was observed that WWTW discharges partially treated sewage into the Mutlumuvi River and a notice was issued. A follow-up inspection was conducted on the 20 November 2013 and a directive was issued to the Municipality for continuous discharge of partially treated	Not Resolved	Fairbridge Mnisi

						sewage. A follow-up inspection was conducted on the 15 January 2014 and the situation was not resolved. Following the follow-up inspection a criminal case was opened with Thulamahashe Police Station on the 24 February 2014. A follow-up inspection was conducted on the 19 August 2014 and nothing has been done since criminal case has been opened. A letter dated 17 November 2014 was issued to the Administrator to determine what their plans to rectify the situation are. Another follow-up inspection was conducted on the 03		



						March 2015 and the situation was not rectify instead the situation become worsened. The IUCMA will arrange for a meeting with the Investigating Officer and the Prosecutor to ascertain the progress of the pending criminal case opened against BLM. A follow-up inspection was conducted on the 11 June 2015 and it was observed that the WWTW bypasses the sewage inflow into the first pond. The first pond was covered with scum. The final pond and the chlorination house was not inspected due to the inaccessibility of the area.		

						The IUCMA will draft a letter to the Thulamahashe Police Station to requesting progress of the criminal case opened.		
4	For failing to prevent pollution due to partially treated water discharged at Mkhuhlu WWTW	30 September 2013	15 January 2014	06 March 2014		A notice was issued for the discharge of partially treated sewage into the Mapaleni Stream which is a tributary of Sabie River. A follow-up inspection was conducted on the 25 November 2013 and it and a directive was issued for the discharge of partially treated sewage into the Mapaleni Stream which is a tributary of Sabie River. A follow-up inspection was conducted on the 3 February 2014 and a courtesy letter was issued notifying the Municipality that the IUMCA will proceed to open a criminal case.	Resolved	Bongiwe Sambo

						Representation was received on the 30 April 2014 from the BLM stating that they have appointed service provided to fix the pumps and the contract is for the period of 3 months. A follow-up inspection was conducted on the 22 August 2014 and it was observed that the pumps are working and the emergency dams was empty but the WWTW was discharging partially treated effluent to the stream. A letter dated 08 October 2014 was sent to the Municipality. BLM must submit plans to rectify the situation. Follow up inspection was conducted on the 03 March		

						2015. The wwtw was not functional. Inflow from the inlet was bypassed to the Emergency pond then discharged. A courtesy letter dated 06 March 2014 was issued to the Municipality informing them that a criminal case will be opened. Another follow up inspection was conducted on the 09 June 2015. It was observed that the plant has been fixed and was functional. A feedback letter was sent to the BLM acknowledging the work done in fixing the wwtw. Quarterly inspections will be conducted.		
5	For failing to prevent pollution at Manghwazi	25 October 2013	06 March 2014			A notice was issued. The WWTW was not functional,	Not Resolved	Bongiwe Sambo

	Bio-disc Wastewater Treatment Works					no inflow, no outflow. A follow-up inspection was conducted on the 3 February 2014 and a directive was issued. A follow-up inspection was conducted on the 22 August 2014 and the WWTW was not functionally. A courtesy letter dated 17 September 2014 has been sent to the administrator of BLM. Awaiting response from the BLM. A follow up inspection was conducted on the 03 March 2015 and another on 20 June 2015. The WWTW is still not functional. A criminal case will be opened against the Municipal Manager and a courtesy letter in that regard		

						was sent dated 30 June 2015.		
6	For failing to prevent pollution due to partially treated wastewater discharged at Tintswalo WWTW	26 June 2014	02 September 2014	26 January 2014		An inspection was conducted on the 23 May 2014, and it was observed that the WWTW discharges partially treated sewage into the environment with sludge floating and that the humus tank was covered with sludge. A follow-up inspection was conducted on the 07 August 2014 and the WWTW was discharging partially treated sewage into the environment and the directive dated 02 September 2014 was issued. A follow-up inspection was conducted on the 14 November 2014 A courtesy letter dated 26 January 2015 was issued to	Not Resolved	Fairbridge Mnisi / Adolph Mbetse / Golden Mthembi

						the MM notifying him that the IUCMA will proceed to open a criminal case. A follow-up inspection was conducted on the 20 May 2015, and it was observed that the division box was full of sludge, desludging pumps were not working. A feedback letter was issued to the MM stating that they must apply for the water use authorization.		
7	For failing to prevent pollution due to partially treated wastewater discharged at Dwarsloop WWTW	04 March 2014	27 February 2015	30 June 2015		A notice was issued for the discharge of partially treated sewage into the Nwarele Stream. A follow-up inspection was conducted on the 04 February 2015 and a directive was issued for the discharge of partially treated sewage into the Nwarele	Not Resolved	Bongiwe Sambo

						Stream A follow-up inspection was conducted on the 26 June 2015 and a courtesy letter was issued notifying the Municipality that the IUMCA will proceed to open a criminal case.		
Umjindi Local Municipality								
1	For failing to prevent pollution due to partially treated wastewater at Umjindi WWTW.	05 July 2013	23 June 2014			A representation was received from the municipality and was accepted by the IUCMA. A follow up inspection was conducted on the 04 December 2013 and the Municipality has failed to adhere with the timeframes as stated in their representation. A courtesy letter dated 04 February 2014 was issued to the Municipality notifying	Not Resolved	Fairbridge Mnisi / Manty Mashaba

						the Municipal Manager that a directive will be issued. A follow-up inspection was conducted on the 04 June 2014 and during the inspection it was observed that the WWTW was discharging partially treated sewage with sludge floating and a directive was issued. A Follow-up inspection was conducted on the 24 October 2014, and it was observed that both sides of the plant were working and the first clarifier was covered with sludge. The IUCMA will continue to monitor progress of the work being done to improve the plant on a quarterly basis. A follow-up inspection was conducted on the 04 June		

						2015 and it was observed that one screen was not working, sludge pump was not working and that there were traces of sewage overflow in the aeration wall. A courtesy letter date 30 June 2015 was issued notifying the MM that the IUCMA will proceed to open a criminal case.		
Nkomazi Local Municipality								
1	For failing to prevent pollution due to neglected Komatipoort WWTW.	24 July 2013	25 October 2013	7 February 2014		An inspection was conducted on the 13 June 2013, and it was observed that the WWTW discharges partially treated sewage into the Crocodile River and a notice was issued. A follow-up inspection was conducted on the 07 October 2013 and the Municipality did not do anything to fix the situation	Resolved	Fairbridge Mnisi

						and a directive was issued. A follow-up inspection was conducted on the 12 February 2014 and a courtesy letter notifying the Municipality that the IUCMA will proceed to open a criminal case. Representation was received from the Municipality and response letter was issued to the Municipality stating that the IUCMA will conduct follow-up inspection. A follow inspection conducted on the 02 April 2014. The Municipality was busy with refurbishment of the plant. A chlorine house was erected and a security house. There was inflow into the		

						WWTW but there was no discharge. A follow-up inspection was conducted on the 12 September 2014 and pond 1 was in use and there was no discharge from the ponds into the Crocodile River, however there was still sewage overflow on the ground. The municipality was advised to clean the ground covered with traces of sewage. A routine inspection was conducted on the 11 May 2015 and a feedback letter was issued to the municipality with recommendations. Routine inspections will be conducted on a quarterly basis.		
2	For failing to prevent pollution due to partially treated water discharged	26 September				A follow-up inspection was conducted on the 02 April 2014 at the WWTW and it	Partially Resolved	Bongiwe Sambo

	at Hectorspruit WWTW.	2013 25 April 2014				was observed that there was no inflow and outflow into the WWTW and another notice was issued. A follow-up inspection was conducted on the 21 August 2014 and it was observed that there are improvements at the WWTW, A new chlorine gas system was installed. A feedback letter was sent on the 10 October 2014 requesting the Municipality to submit proof of water quality monitoring results and to apply for a water use license. A routine inspection was conducted on the 11 May 2015 and a feedback letter was issued to the municipality with recommendations.		

						Routine inspections will be conducted on a quarterly basis.		
3	For failing to prevent pollution due to partially treated water discharged at Mhlathiplaas WWTW	26 September 2013	30 June 2014			A follow-up inspection was conducted on the 7 February 2014. A follow-up inspection was conducted on the 3 June 2014 and it was observed that the ponds were still covered with algae and the ponds were discharging partially treated effluent into the Crocodile River and a directive was issued dated 30 June 2014. A follow up inspection will be conducted to ascertain whether the municipality has done anything to rectify the situation. A follow-up inspection was	Not Resolved	Bongiwe Sambo / Rofhiwa Ramunenyiwa

						conducted on the 22 June 2015 and it was observed that the ponds were clean from algae. A feedback letter was issued to the Municipality with recommendations.		
4	For failing to prevent pollution due to partially treated water discharged at Mhlatikop WWTW	27 September 2013	-			The Municipality was busy with the refurbishment of the plant. A feedback letter was sent dated 19 March 2014. A follow-up inspection was conducted on the 21 August 2014 and it was observed that the contractor has completed phase 1 refurbishment the WWTW. A feedback letter was sent to the Municipality Routine inspections will be conducted on a quarterly basis.	Not Resolved	Bongiwe Sambo

						A follow-up inspection was conducted on the 14 May 2015 and it was observed that the inflow meter was not working and the clarifier still had some suspended solids. A feedback letter was issued to the municipality with recommendations.		
5	For failing to prevent pollution due to overflow of sewage into the unnamed stream (Transnet Offices)	30 June 2015				An inspection was conducted on the 30 April 2015 at the Transnet Offices next to the Orlando Pump Station and it was observed that there was an overflow of sewage into the unnamed stream. A notice of intention to issue a directive dated 30 June was issued to the Municipality.	Not Resolved	Manty Mashaba
6	For failing to prevent pollution due to partially treated water discharged at Tonga ponds WWTW	30 June 2015				An inspection was conducted on the 25 June 2015, and it was observed that the bar screens were not in place and the works is overloaded and overflowing into the		Golden Mthembi

						Komati River. A notice of Intention to issue a directive dated 30 June 2015 was issued to the Municipality.		
Emakhazeni Local Municipality								
1	For failing to prevent pollution due to partially treated wastewater discharged at Emthonjeni WWTW.	03 June 2013	26 June 2014			An inspection was conducted on the 13 April 2013 at Emthonjeni WWTW and it was observed that the WWTW discharges partially treated sewage into the Leeuwspruit. A follow-up inspection was conducted on the 02 June 2014 and it was observed that the WWTW discharges partially treated sewage into the Leeuwspruit and a directive dated 26 June 2014 was issued. A follow-up inspection was conducted on the 27 October 2014 and it was observed that the WWTW	Not Resolved	Fairbridge Mnisi / Manty Mashaba

						discharges partially treated sewage into the Leeuwspruit. A courtesy letter dated 10 December 2014 was issued to the Municipality stating that the IUCMA will proceed to open criminal case against the Municipal Manager. A follow up was conducted on the 22 May 2015 and it was observed that the WWTW was not functional due to the fact that there was no electricity from the 18 March 2015. The WWTW discharges raw sewage into the Leeuwspruit. The IUCMA will proceed to open a criminal case against the MM of ELM.		
2	For failing to prevent pollution due to partially treated sewage at	15 August 2013	12 March 2014			Representation was received from the Municipality requesting extension due to	Not Resolved	Bongiwe Sambo / Manty

	Waterval Boven WWTW					the strike. A follow-up inspection was conducted on the 10 July 2014 and it was observed that there was evidence of workings however the contract was not onsite. A courtesy letter dated 03 September 2014 was issued notifying the Municipal Manager that the IUCMA will proceed with the opening of criminal case. An inspection was conducted on the 27 October 2014 however there was no access to the WWTW. A follow up inspection was conducted on the 06 March 2015. A criminal case will be opened against the Municipal Manager.		Mashaba

						Another follow-up inspection was conducted on the 22 May 2015 and it was observed that the some sewage does not reach the WWTW due to the manhole overflow. A criminal case will be opened against the Municipal Manager.		
Chief Albert Luthuli Local Municipality								
1	For failing to prevent pollution due to partially treated wastewater discharged at Carolina WWTW.	06 June 2013	09 September 2013	03 December 2014		An inspection was conducted on the 14 May 2013, and it was observed that the WWTW discharges partially treated sewage into the environment and notice was issued. A follow-up inspection was conducted on the 04 September 2013 and it was observed that the municipality did not do anything to fix the situation and a directive was issued.	Not Resolved	Fairbridge Mnisi

						A follow-up inspection was conducted on the 16 May 2014, and it was observed that the WWTW discharges partially treated sewage and a courtesy letter dated 26 June 2014 and was acknowledged on the 06 August 2014 was issued informing the Municipal manager that the IUCMA will proceed with the opening of a criminal case. A follow-up inspection was conducted on the 21 October 2014 and it was observed that the Municipality did not done anything to rectify the situation. A letter dated 03 December 2014 was written to the Municipal Manager determining what plans the municipality has to rectify the situation.		

						Another follow-up inspection will be conduct to ascertain if the municipality has done something to rectify the situation and statement will be drafted to open a criminal case against the MM if the situation is not rectified. A follow-up inspection was conducted on the 12 June 2015 and the was no disinfection of the final effluent taking place The WWTW was discharging partially treated sewage with some floating sludge into the unnamed stream which is a tributary of Boesmanspruit. The IUCMA will proceed to open a criminal case against the MM of CALLM.		
2	For failing to prevent pollution due to partially treated wastewater discharged at Elukwatini	06 March 2014	26 June 2014			An inspection was conducted at the Elukwatini WWTW and it was observed that the WWTW discharges partially	Not Resolved	Bongiwe Sambo

	WWTW.					treated sewage into the Tee River. A follow-up inspection was conducted on the 4 June 2014 and it was observed that the WWTW discharges partially treated sewage into the Tee River and disinfection of the final effluent is not taking place and a directive dated 26 June 2014 was issued. A follow-up inspection was conducted on the 25 November 2014. A courtesy letter has been sent dated 21 January 2015 informing the Municipal Manager that a criminal case will be opened against him		
3	For failing to prevent pollution due to pump station sewage spillage at the Silobela Township	26 June 2014	02 September 2014			An inspection was conducted on the 06 May 2014 and it was observed that the pump station was overflowing,	Not Resolved.	Golden Mthembi

	(Guduza) wastewater pump station.					debris blocked the inlet screen. A follow up inspection was conducted on the 04 August 2014 and again on the 28 August 2014 and it was observed that the pump station was overflowing and debris blocked the inlet screen. A directive dated 02 September 2014 was issued to the Municipality and follow up inspection will be conducted on 08 January 2015.		
4	For failing to prevent pollution due to pump station overflow Rooival at R36 Road	15 August 2014	04 November 2014			An inspection was conducted at Rooival Pump Station. Notice dated 15 August 2014 was issued. Another follow-up inspection was conducted on the 20	Resolved	Golden Mthembi

						August 2014 and the Pump Station was not rectified. Directive dated 04 November 2014 was issued. A follow up inspection was conducted on 13 May 2015 and it was found that the pump station has been fixed.		
5	For failing to prevent pollution due to sewage manhole overflow at Julius Mkhonto RDP's settlement		15 April 2015			An investigation was conducted on the 14 April 2015, and it was observed that there were continues sewage manholes overflow. A verbal directive was issued to the CALLM official to immediately stop the manholes overflow, which was confirmed with the written directive dated 16 April 2015.	Resolved	Mnisi Fairbridge

						A follow-up inspection was conducted on the 08 May 2015 and it was observed that the manholes were fixed. An acknowledgement letter dated 29 June 2015 was issued to the CALLM.		
Msukaligwa Local Municipality								
1	For failing to prevent pollution due to partially treated wastewater discharged at Breyten Oxidation Ponds	15 January 2014	17 September 2014			An inspection was conducted on the 11 November 2013 and it was observed that the WWTW discharges partially treated sewage into the environment. A Follow-up was conducted on the 04 September 2014 and the WWTW was discharging partially treated into the neighboring farm and directive date 17 September 2014 was issued. Another follow-up inspection	Not Resolved	Fairbridge Mnisi

						was conducted on the 27 November 2014. A courtesy letter has been sent dated 20 January 2015 informing the Municipal Manager that a criminal case will be opened against him. A follow-up inspection was conducted on the 14 April 2015 and it was observed that the ponds were cleaned except pond 4. A follow-up inspection will be conducted to ascertain progress regarding the cleaning of ponds.		
Department of Public Works								
1	For failing to prevent pollution due to partially treated wastewater discharged at Shongwe Hospital WWTW.	25 July 2013	14 January 2014			Representation was received from the Department of Public Works dated 25 March 2014.	Not Resolved	Bongiwe Sambo

						A meeting was held with the Department of Public Works, Roads and Transport on the 20 June 2014. A follow up inspection was conducted on the 08 July 2014. It was observed that there was an overflow of partially treated sewage from pond 1. A section 20 directive was issued (see number 6 below). A follow-up inspection was conducted on the 14 August 2014 and it was observed that there was no overflow from the first pond into the environment but there sewage was diverted. From the humus tank, partially treated effluent was bypassed by a pipe and discharged into a stream A courtesy letter has been sent dated 08 October 2014		

						informing the Head of Public Works that a criminal case will be opened against him. A routine inspection was conducted on the 25 May 2015 and it was observed that the plant was not functional. A courtesy letter dated 30 June 2015 was issued to the Municipality informing them that the IUCMA will proceed to open a criminal case against the MM.		
2	For failing to prevent pollution due to partially treated wastewater discharged at Tonga Hospital WWTW.	28 October 2013 and 06 March 2014	11 December 2014			Representation was received from the Department of public works and the IUCMA rejected it because it did not address the issues raised in the notice. A follow up inspection was conducted on the 3 June 2014, and it was observed that the WWTW discharges partially treated sewage with floating sludge.	Not Resolved	Bongiwe Sambo / Golden Mthembi

						A meeting was held with the Department of Public Works, Roads and Transport on the 20 June 2014. A feedback letter was sent to the Department of Public Works dated 30 June 2014. A follow up inspection was conducted on the 08 July 2014 and currently waiting for a response from Public Works as per agreement in the meeting that was conducted No response has been received from Public Works. A follow up inspection was conducted on the 27 November 2014 and a directive dated 11 December		

						2014 was issued. Another follow-up inspection was conducted on the 25 May 2015 it was observed that only one aeration disk was working. Following the inspection conducted on the 25 May 2015, the IUCMA issued a second courtesy letter notifying the HoD that the IUCMA will proceed with the opening of the criminal case.		
3	For failing to prevent pollution due to partially treated wastewater discharged at Louiville WWTW.	24 October 2013	12 March 2014	19 March 2015		No representation was received from the Department of Public Works. A follow-up inspection was conducted on the 15 May 2014 and it was observed that the WWTW discharges partially treated sewage into the Low's creek.	Not Resolved	Fairbridge Mnisi / Rofhiwa Ramunenyiwa

						A meeting was held with the Department of Public Works, Roads and Transport on the 20 June 2014. A feedback letter was sent to the Department of Public Works dated 25 June 2014. A follow up inspection was conducted on the 08 July 2014. Currently waiting for a response from Public Works as per agreement in the meeting that was conducted. A follow-up inspection was conducted on the 11 February 2015. A courtesy letter dated 19 March 2015 was issued to the HoD notifying him that the IUCMA will proceed to open criminal case.		

						A follow-up was conducted on the 3 June 2015 and it was observed that the WWTW inflow meter was not working and that the WWTW discharges partially treated sewage into the Low's Creek. The IUCMA will proceed to open a criminal case against the HoD of Public Works.		
4	For failing to prevent pollution due to partially treated wastewater discharged at Lebombo WWTW.	27 September 2013				Representation was received from National Department of Public Works still under consideration. A follow up inspection was conducted on the 08 August 2014. A feedback letter date 23 October 2014 was issued stating that the representation was	Not Resolved	Fairbridge Mnisi

						unsatisfactory pending the additional information requested. Meeting was held on the 19 November 2014 between the IUCMA and the NDPW and a joint inspection will be conducted. Attempts to arrange a joint meeting with the officials of the NDPW did not yield any results. A follow up inspection will be conducted and a directive issued if the concerns have not been resolved.		
5	For failing to prevent pollution due to partially treated wastewater discharged at Oshoek WWTW.	27 September 2013	17 September 2014			Representation was received from National Department of Public Works however it was not sufficient and did not address the issues raised in the notice.	Not Resolved	Fairbridge Mnisi

						A follow-up inspection was conducted on the 05 September 2014 and it was observed that the WWTW discharges partially treated sewage into the environment and directive dated 17 September was issued. Representation was received on the 31 October 2014. Meeting was held on the 19 November 2014 between the IUCMA and the NDPW and a joint inspection will be conducted. A follow up inspection was conducted on 30 June 2015. A courtesy letter informing the Regional manager of the IUCMA's intention to open a criminal case has been sent		

						dated 3-0 June 2015.		
6	For failing to prevent pollution due to partially treated wastewater discharged at Bongani Hospital WWTW.	05 December 2014 30 June 2015				A follow-up inspection was conducted on the 12 November 2014 and it was observed that the WWTW discharges partially treated sewage into the Sand River. A notice dated 05 December 2014 was issued. Another follow up inspection was conducted on the 09 June 2015 it was observed that the electricity at the WWTW was restored and the wwtw was functional. No proof of water use authorisation was submitted. A notice of intention to issue a directive in terms 53 (1) of the NWA dated 30 June 2015 was issued to the Department of Public Works.	Not Resolved	Bongiwe Sambo
7	For failing to prevent pollution due to partially	05 December				A follow-up inspection was conducted on the 12	Not Resolved	Bongiwe

	treated wastewater discharged at Barberton Prison WWTW	2014				November 2014 and it was observed that there was no inflow going into WWTW. A notice dated 05 December 2014 was issued. Representation was received and accepted by the IUCMA. A routine inspection was conducted on the 3 June 2015 and a feedback letter was issued to the Department of Public Works with recommendations. Follow up inspections will be conducted to ascertain whether the department is complying to the timeframes committed to in the representation letter.		Sambo
Private owned WWTW								
1	Acornhoek Plaza Ponds For	26 April 2013	26 June			A follow-up inspection was	Not Resolved	Fairbridge

	failing to prevent pollution due to partially treated wastewater		2014			conducted on the 10 June 2014, and it was observed that WWTW discharges raw sewage into the environment and a directive was issued. Representation was received still under consideration. The WULA has been received by the IUCMA. A follow-up inspection was conducted on the 10 June 2015 and it was observed that the screenings are disposed in a trench and that the HTH is used to disinfect the final effluent.		Mnisi / Golden Mthembi -
2	Forever Resorts (Aventura) Badplaas For failing to prevent pollution due to partially treated wastewater	26 September 2013				Representation was received from Forever Resort (Aventura) Badplaas and was accepted by the IUCMA. A follow up inspection was	Partially Resolved	Bongiwe Sambo

						conducted in March 2014 to ascertain whether measures stated in the representation have been implemented. A feedback letter was sent on the 26 June 2014. Forever Resort (Aventura) Badplaas is in the process of applying of a WUL. Forever resorts is submitting their monthly monitoring data and the results are compliant. Routine inspections will be conducted on a quarterly basis.		
3	Caltex/Millys For failing to prevent pollution due to partially treated wastewater	01 August 2013				Representation was received from Caltex/Milly's and was accepted by the IUCMA. An action plan has been submitted.	Partially Resolved	Bongiwe Sambo

						A progress report was submitted to the IUCMA dated 10 June 2014. Caltex/Milly's requested extension on the submission of the WULA. Extension of time has been granted to the 17 October 2014 to the submission on the WULA. The WULA has been submitted to the IUCMA. A routine inspection was conducted on the 20 May 2015 and a feedback letter was issued to the municipality with recommendations. Routine inspections will be		

						conducted on a quarterly basis.		
4	Sabie River Sun For failing to prevent pollution due to partially treated wastewater	31 October 2013	30 June 2014			A follow up was conducted on the 14 May 2014 and it was observed that the WWTW discharges partially treated sewage into the Sabie River and the discharge of wastewater from the Hippo pond into the Sabie River and a directive was issued dated 30 June 2014. Representation has been received. Representation was assesses and it was unsatisfactory and not responding to all the issues raised in the directive. A letter was sent to the Hotel on the 17 October 2014 informing the Hotel the	Partially Resolved	Bongiwe Sambo

						IUCMA will proceed to open a criminal case. The WULA was submitted to the IUCMA. A GA has been granted to Sabie River Sun Follow up inspections will be conducted to ascertain compliance to the conditions of the GA.		
5	Nkomazi (Naas) Plaza For failing to prevent pollution due to partially treated wastewater	26 September 2013	23 June 2014			No representation was received from Naas Plaza. A follow-up inspection was conducted on the 15 May 2014. A directive dated 23 June 2014 was issued. A follow up inspection will be conducted and samples from the final effluent will be collected to monitor the	Not Resolved	Bongiwe Sambo

						quality of discharge. A follow up inspection was conducted on the 14 May 2015 and it was observed that the pump that was previously non-functional has been repaired. A section 53 Notice was dated 30 June 2015 was issued for the water uses taking place without an authorization.		
Industries								
1	Safika Oosthuizen Breyten operations – for the discharge of wastewater into the wetland.	9 September 2013				Meeting was held in October 2013. In a process of applying for a WULA. A follow-up inspection was conducted on the 04 September 2014 and representations was received during the inspection.	Not Resolved	Fairbridge Mnisi

						A feedback letter dated 23 October 2014 was issued stating that the representation was unsatisfactory pending the additional information requested. Representation dated 01 November 2014 was received and still under consideration and Water quality results was received from NviroTek labs. Feedback will be provided. The representations will be assessed and a follow up inspection conducted to check the water use activities that are being exercised.		
2	Cape Fruits Malelane - For failing to prevent pollution due to partially treated wastewater	31 October 2013				Representation was received from Cape Fruit Malelane and was accepted by the IUCMA.	Partially resolved	Bongiwe Sambo / Manty Mashaba -

						Consultation meeting and follow-up inspection was conducted on the 24 April 2014. Feedback letter was sent dated 26 June 2014. Cape Fruits Malelane is liaising with water quality regarding their WUL application. Routine inspections will be conducted on a quarterly basis. A follow-up meeting was conducted on the 10 June 2015 regarding the Water use authorization application. It was concluded that the application will be submitted on the 07 July		

						2015.		
3	York Timber - For failing to prevent pollution due to partially treated wastewater and discharge of wastewater into a wetland.	31 January 2014				Representation was received from York Timber (Sabie Mill). A follow up inspection was conducted on the 20 November 2014 and a feedback letter issued on the 18 March 2015. Another follow up inspection was conducted in May 2015 and it was agreed that the license application will be withdrawn and an integrated water use license submitted covering all water uses. A commitment was also made in the representation letter that the WWTW will be phased out and the industry connected to the municipal sewer line.	Not Resolved	Bongiwe Sambo
4	Caltex (Milly's) – for disposal of wastewater into a pond without authorisation.	15 August 2013				Representation was received from milly's Factory however the representation was not fully accepted by the IUCMA because it didn't fully address all issues stated in		Bongiwe Sambo

						the Notice. A follow up inspection was conducted on the 27 October 2014. A meeting was held on the 02 December 2014. IWULA was submitted. Routine inspections will be conducted on a quarterly basis.		
5.	Dayizenza Plaza - For failing to prevent pollution due to partially treated wastewater and discharge of wastewater into a wetland.	05 December 2014				An inspection was conducted on the 6 October 2014 and it was observed that the final effluent was discharged into a wetland on a land owned by Sifidza family. A notice dated 5 December 2014 was issued. A follow up inspection was	Not Resolved	Bongiwe Sambo

						conducted on the 06 December 2014 and it was observed that the wwtw was still discharging its effluent into a wetland on Sifundza's family land and not according to the license conditions. A follow up inspection and Meeting was conducted on the 20 February 2015. The amended WULA will be sent to the IUCMA. This is a new activity and a monitoring point for their discharge will be established to ascertain compliance to the water use license conditions.		
6	Sanibonani Resort	30 June 2015				An inspection was conducted on the 11 June 2015 and the following was observed:	Not Resolved	Bongiwe Sambo

						Housekeeping was good. There were sludge drying beds on site The final effluent was stored in a wastewater pond after treatment. Some of wastewater from the pond was used for irrigation on the surrounding of the lodge and some of the wastewater was overflowing into the Sabie River. No proof of water use authorisation was submitted. A notice of intention to issue a directive in terms 53 (1) of the NWA dated 30 June 2015 was issued to Sanibonani Resort.		
Mines								
1	Eastside Colliery – collapse of PCD		14 March 2014			Representation was received from Eastside colliery. A follow up inspection was conducted on 11 March	Not resolved	Fairbridge Mnisi / Golden Mthembi

						2014. Another follow-up inspection was conducted on the 22 May 2014 and feedback letter date 30 June 2014 was issued to the Mine stating that they did not comply with the directive issued and more information was requested from the mine. A follow-up inspection will be conducted on the 18 July 2014. Meeting with regarding extension of time to submit all required reports and extension was granted. Representation was received on the 19 September 2014 still under consideration. Civil designs report is forwarded to Marius Kolesky for his inputs to the matter.		

						Groundwater report is forwarded to the Department of Water and Sanitation for assessment and feedback letter will be written to EC after receiving the comments. Report was received from Marius. A meeting was held on 10 June 2015 between the IUCMA and Eastside Coal regarding the construction of the Stormwater berms and it was agreed that they can proceed with the construction		
2	Droogvallei Rail Siding – overflow of wastewater from the PCD		14 March 2014			Representation was received from Droogvallei Rail siding. A follow up inspection was conducted on 11 March 2014. Droogvallei Rail Siding	Not Resolved	Bongiwe Sambo

						requested for extension until 30 April 2014. A follow-up inspection was conducted on the 22 May 2014 and a feedback letter was issued dated 30 June 2014. . A follow-up inspection was conducted on the 18 July 2014. An action plan was received and accepted including the submission of the designs for the lining of the pollution control dam. the mine committed to commence construction during the dry season. A follow up inspection will be conducted to establish if		

						construction has started since we are now in the dry season.		
3	Barbrook Mine for tailings spillage		20 September 2013			Representation was received from Barbrook Mine the mine requested for extension of time for conducting the GN704 audit and submission of the report. GN 704 audit report was received on the 01 September 2014. A feedback dated 17 November 2014 was issued to the mine. The mine requested extension to submit the additional information and was granted until end of February 2014. Barbrook mine has submitted the IWULA date 30 June 2015. The IUCMA will assess the application	Not Resolved	Fairbridge Mnisi / Rofhiwa Ramunenyiwa

						and give feedback to the mine. An assessment will be made of the documentation submitted to ascertain if there are any shortcomings and a determination made to whether the concerns have been resolved.		
4	TGME Rietfontein wants to start with the re-mining operation and license is not issued as yet.	15 August 2013				Representation was received from TGME Rietfontein and more information was requested from TGME. A follow-up inspection was conducted on the 19 February 2014 and it was observed that there was no mining activities taking place. Authorization was granted to the Mine dated 11 January 2015.	Resolved	Fairbridge Mnisi

						The IUCMA will conduct inspections on a quarterly basis to monitor compliance to the License conditions.		
5	Elandshoogte Gold Mine to start with the re-mining operation and license is not issued as yet.	27 November 2013				Representation was received from Elandshoogte Gold Mine. To draft feedback letter and conduct follow-up inspection. A follow up inspection was conducted in November 2014 and the mine submitted their water use license application. A pre-consultation and site inspection was conducted with the WQ officials regarding the outstanding information in their license application. The license has been	Not Resolved	Fairbridge Mnisi / Rofhiwa Ramunenyiwa

						submitted and is still under review.		
6	Sheba Gold Mine – Overflow /spillage of wastewater into the river.	16 January 2014 27 March 2015 30 June 2015				Representation was received from Sheba Gold Mine. A follow up inspection was conducted on the 26 February 2015 and another notice was issued dated 27 March 2015. The mine produced proof that their application for S21(c & i) were omitted and they have embarked on an application for an amendment of their water use license in response to a Section 53 directive. A routine inspection was conducted on the 17 June 2015 and a notice of intention to issue a directive dated 30 June 2015 was	Not Resolved	Bongiwe Sambo

						issued to the mine for the illegal overflow of plant process water into the Snyman's Creek and the poor operation of the WWTW.		
7	Galaxy Gold Mine -	30 September 2013	23 June 2014			A follow-up inspection was conducted on the 13 May 2014. The dam next to the workshop was not lined; there were traces of previous spillages. WWTW was discharging partially treated effluent into the River. A directive has been issued dated 23 June 2014. Representation was received. A courtesy letter was sent to the Mine on the 24 October 2014 informing the Mine the	Not Resolved	Bongiwe Sambo

						IUCMA will proceed to open a criminal case. A site inspection was conducted on the 01 December 2014. The mine was directed to submit an action plan by the 12 December 2014. Plan has been submitted. Feedback has been sent to the Mine. The IUCMA will conduct follow up inspection to ensure that the time-frames have been adhered to.		
8	Galaxy Gold Mine – overflow from the PCD.		19 June 2013			Representation has been received and the monitoring schedule has been reduced. The action plan for the mine indicated under number 7.	Not Resolved	
9	Pembani Coal Mine, Carolina - Overflow of wastewater from the		26 June 2014			An inspection was conducted on the 09 June 2014.	Partially Resolved	Bongiwe Sambo

	Make-up water Dam					A directive was issued for the overflow of wastewater from the Make-up Water Dam dated 24 June 2014. Meeting was held on the 25 August 2014. GN 704 audit report has been received. Comments regarding the design of the PCD were sent to PCC on the 21 January 2015. Amended of IWULA has been submitted to the IUCMA. The mine is making effort to comply with the directive but they have not finished		

						with the action plan.		
10.	Pembani Coal Mine – Backfilling of mine void with discard.	23 June 2014	21 August 2014			An inspection was conducted on the 09 June 2014 and it was observed that the mine was using discard material to backfill the Groenvallei pit. There was evidence previous run-off from the pits. A notice was issued and directive was issued to the mine to temporarily store the discard material on an existing coal loading pad. A directive was issued dated 21 August 2014. Extension of time has been granted to Pembani to 10 December 2014. A meeting was held on the	Not Resolved.	Bongiwe Sambo

						30 October 2014. The mine requested for further extension of time on the directive. Extension of time has been granted to 28 February 2014. Routine inspections will be conducted on a quarterly basis. The mine is making effort to comply with the directive but they have not finished with the action plan.		
11	TGME Elandsdrift Mine – Control of erosion from the leach pad	30 June 2014				An inspection was conducted on the 17 June 2014 and it was observed that there the operation as seized and the Heap Leach Pad is under care and maintenance. Representation dated 13 August 2014 was received	Not Resolved	Fairbridge Mnisi

						and a feedback letter will be written to the mine during the fourth quarter. A follow-up inspection was conducted on the 19 February 2015 and the mine has started with the erosion control on the Heap Leach Pad. Feedback letter dated 20 March 2015 was issued. A follow up inspection will be conducted to ascertain the progress.		
12	NKK Colliery – Bulk sampling without authorisation	16 September 2014				An inspection was conducted on the 18 August 2014 and it was observed that the NKK Colliery has started with coal bulk sampling, NKK Colliery abstract water from the pit for dust suppression and has mine through a wetland.	Not Resolved	Fairbridge Mnisi

						Representations dated 3 November 2014 was received and still under consideration. A follow-up inspection was conducted on the 19 June 2015, and it was observed that there was no mining activities taking place. A feedback letter dated 30 June 2015 was issued to the mine manager stating that the representations received was unsatisfactory and that the IUCMA is still waiting for the submission of the IWULA application.		
13	Msobo Coal: Tselentis Colliery -	26 June 2014				An inspection was conducted on the 21 May 2014 and the following was observed: Two Pollution Control Dams (PCD's) next to the mine		

						processing plant which were not properly constructed and managed, there was also evidence of coal residue on the ground. The old discard dump has been left unattended and black wattle trees have grown around the discard dump. A notice was issued to the mine dated 26 June 2014. Representations was received and still under consideration. Groundwater report was forwarded to the Department of Water and Sanitation for assessment and feedback letter will be written to Msobo Coal after receiving the comments.		

						Comments were received from the DWS and to finalize the feedback letter to the mine. A follow up inspection will be conducted to establish progress in addressing the concerns raised against the mine.		
14	Msobo Coal – Witrand Siding	30 June 2015				An inspection was conducted on the 18 June 2015 and the following was observed: There were no activities taking place at the siding. There were two (2) sumps which collects storm water and drains into the pollution control dams. There were two (2) pollution control dams which were not lined. The pollution control dams were overgrown with weeds. There was coal a stockpile	Not Resolved	Bongiwe Sambo

						left on site. There was some remnant carbonaceous material. No proof of water use authorisation was submitted. A notice of intention to issue a directive in terms of section 19(3) and 53 (1) of the NWA dated 30 June 2015 was issued to Msobo Coal.		
FARMS								
1	Walkersons	29 June 2015				An inspection was conducted on the 22 May 2015 and it was observed that the farm abstract water from the Lunsklip River and has constructed a septic tank with authorization. The IUCMA has issued a notice of intention to issue a directive in terms of Section 19 and 53 notices dated 29 June 2015 to the farm Manager.	Not Resolved	Manty Mashaba

2	Sukkel 113 JU Portion of Portion 1	29 June 2015				An inspection was conducted on the 10 April 2015 and during the inspection it was observed that there was sand mining activities taking place in unnamed stream. A notice of intention to issue a directive in terms of section 53 of the NWA for engaging in unlawful activity dated 29 June 2015 was issued farm owner.	Not Resolved	Fairbridge Mnisi

CHAPTER 7: THE STATUS OF WATER USE AUTHORISATION

The National Water Act provides in terms of section 22 that "a person may only use water

a). *without a license:*

If the water use is permissible under schedule 1;

If the water use is permissible as a continuation of existing lawful water use; or

If the water use is permissible in terms of a general authorisation issued under section 39

b). if a water use is authorised by a license under the National Water Act; or

c). if the responsible authority has dispensed with a license requirement under section 22(3) of the National Water Act.

The IUCMA therefore keeps a database of all water users in its area of responsibility as well as the status of their water use authorisation. This will enable the IUCMA to achieve three objectives:

Focus its attention on unauthorised activities and thus ensuring that the authorisation process is initiated.

Initiate in advance those authorisation whose timeframes are due to expire.

Audit authorised users to ensure compliance with the conditions of their authorisations.

The tables below show the authorisation status of various water users per catchment. Also shown is the status of water use license applications lodged with the IUCMA with target dates for completion of the assessment.

SABIE CATCHMENT

TABLE 42: AUTHORISED WATER USE ACTIVITIES

No	Mines	Sector	OWNER	AREA	Status	Review	Expiry Date
1	Hazyview WWTW	WWTW	Mbombela Local Municipality	Hazyview	Issued (04/11/2009)	04/11/2014	04/11/2019
2	TGME Glynslydeburg	Mining Gold	TGME/ Stonewall Mining	Sabie	Issued (11 January 2015)	11/01/2019	11 January 2027)
3	TGME: Rietfontein	Mining Gold	TGME/ Stonewall Mining	Sabie	11 January 2015 (Issued)	11/01/2016	January 2024
4	TGME Elandsdrift	Mining Gold	TGME	Sabie			
5	Sabie River Sun	Hotel	Tsogo Sun	Sabie	November 2014 (GA)	-	-
6	Satara	Sewage Works	KNP	Satara	GA		
7	Orpen	Sewage Works	KNP	Orpen	GA		
8	Skukuza	Sewage Works	KNP	Skukuza	GA		
9	Lower Sabie	Sewage Works	KNP	Lower Sabie	GA		
10	Pretoriuskop	Sewage Works	KNP	Pretoriuskop	GA		
11	GPP	Sewage Works	KNP	GPP	GA		
12	Tamboti	Sewage Works	KNP	Tamboti	GA		
13	Talamati	Sewage Works	KNP	Talamati	GA		
14	Satara	Sewage Works	KNP	Satara	GA		

15	Tshokwane	Sewage Works	KNP	Tshokwana	GA		
16	Badplaas WWTW	Sewage Works	Chief Albert Luthuli LM	Badplaas	GA		
17	TGME Elandsdrift	Mining Gold	To locate the license				
18	Sabie River Sun	Hotel	Tsogo Sun	Sabie	November 2014 (GA)	-	-
19	Satara	Sewage Works	KNP	Satara	GA		
20	Orpen	Sewage Works	KNP	Orpen	GA		
21	Skukuza	Sewage Works	KNP	Skukuza	GA		
22	Lower Sabie	Sewage Works	KNP	Lower Sabie	GA		
23	Pretoriuskop	Sewage Works	KNP	Pretoriuskop	GA		

TABLE 43: APPLICATIONS FOR WATER USE AUTHORISATION

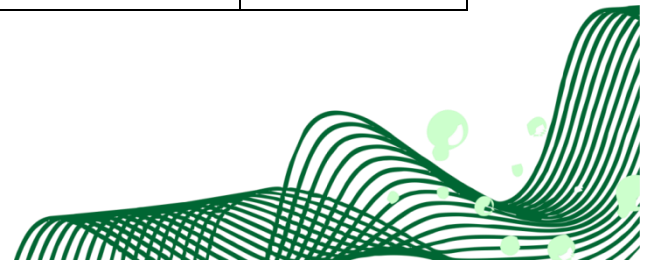
No	Applicant	Sector	Date Submitted	Water Uses	Status	Projected Date Of Completion
1	York Timber (pty) ltd – Sabie sawmill	Industry	September 2012	(a),(c),(f),(g)&(i)	Application was presented to WUAAAC, still waiting for information related to section 21(c and I) to be presented	November 2015
2	Sabi Sabi Bush Lodge	Housing Development	May 2015	(g)	Confirmation of a General Authorisation	October 2015
3	Blue-Haze Mall	Housing Development	February 2015	(b),(c),(i) and (f)	Awaiting Specialist inputs	
4	Acornhoek Plaza	Housing Development	October 2014	(a), (c),(i),(g) and (f)	Awaiting Additional Information from the Applicant	Referred back due to Insufficient information from the Applicant
5	Pinzari-Derust Estate	Housing Development	December 2011	(a),(b), (c),(i) and (f)	Awaiiting Additional Information from the Application and Civil Comments. Presented in WUAAAC and recommended for re-appearance	November 2015

CROCODILE CATCHMENT

TABLE 44: AUTHORISED WATER USE ACTIVITIES

No.	Activity	Sector	Owner	Area	Date Issued	Review Period/Date	Expiry Date
1.	Assmang Chrome and Manganese Processing	Industry	Assmang Chrome Machadodorp Works	Machadodorp	15 October 2008	5 Years	14 October 2024
2.	SAPPI Paper Making	Industry	SAPPI (Pty) Ltd	Ngodwana	01 June 2007	5 Years	31 December 2020
3.	TSB Sugar Cane Refineries	Industry	TSB (Pty) Ltd	Malelane	24 November 1988	No review period	No review period
4.	Sonae Novobord	Industry	Sonae Novobord (Pty) Ltd	Rocky's Drift	17 July 2009	5 years	16 July 2019
5.	Cape Fruit Nelspruit	Industry	Cape Fruit (Pty) Ltd	Nelspruit	25 March 2011	2 years	24 March 2021
6.	Onderberg Verwerkings	Industry	Onderberg Verwerkings Ko-Operasie Beperk	Malelane	30 April 2015	3 Years	29 April 2040
7.	Fairview Gold Mining	Mining	Barberton Mines (Pty) Ltd	Barberton	08 July 2011	3 years	07 July 2021
8.	New Consort Gold Mining	Mining	Barberton Mines (Pty) Ltd	Barberton	17 May 2011	2 years	16 May 2021

9.	Sheba Gold Minning	Mining	Barberton Mines (Pty) Ltd	Sheba	11 January 2015	2 years	10 January 2022
10.	Mbombela Municipality: Kabokweni WWTW	Sewage Works	Mbombela Municipality	Kabokweni	03 June 2015	5 years	02 June 2035
11.	Kingston Vale WWTW	Sewage Works	Mbombela Municipality	Nelspruit	02 June 2009	2 years	01 June 2019
12.	Kanyamazane WWTW	Sewage Works	Mbombela Municipality	Kanyamazane	25 August 2009	5 Years	24 August 2039
13.	Matsulu WWTW	Sewage Works	Mbombela Municipality	Matsulu	(to locate the license)		
14.	White River WWTW	Sewage Works	Mbombela Municipality	White River	21 October 2009	5 years	20 October 2039
15.	Rocky's Drift WWTW	Sewage Works	Mbombela Municipality	Rocky's Drift	20 May 2010	5 Years	19 May 2030
16.	Emthonjeni WWTW	Sewage Works	Emakhazeni Municipality	Emthonjeni	(to locate the license)		
17.	Waterval Boven WWTW	Sewage Works	Emakhazeni Municipality	Waterval Boven	21 November 2011	5 Years	20 November 2022
18.	Umjindi WWTW	Sewage Works	Umjindi Municipality	Barberton	(to locate the License)		
19.	Sappi WWTW	Sewage Works	SAPPI (Pty) Ltd	Ngodwana	01 June 2007	5 Years	31 December 2020



20.	Dayizenza (Pty) Ltd WWTW	Sewage Works	Dayizenza (Pty) Ltd	Hazyview	22 August 2015	5 Years	21 August 2034
21.	Tekwane North WWTW	Sewage Works	Sembcorp Sililumanzi	Tekwane North	30 August 2013	GA	29 August 2018
22.	Cort Fish Farm	Off – Channel Aquaculture	Cort fish (Pty) Ltd	Schoemanskloof	02 May 2012	5 Years	01 May 2032
23.	Sheer Properties	Residential Complex	Sheer Props CC	White River	12 December 2012	5 years	11 December 2032
24.	Moyamanzi Farming	Residential complex	Moyamanzi Farming cc	White River	12 February 2011	2 Years	11 February 2017
25.	Loeriesfontein Boedery	Residential complex	Loeriesfontein Boedery (Pty) Ltd	Schagen	3 June 2015	5 Years	02 June 2035
26.	Malelane Rest Camp WWTW	Sewage Works	KNP	Malelane	GA		
27.	Crocodile Bridge Rest Camp	Sewage Works	KNP	Komatipoort	GA		
28.	Berg n Dal Rest Camp	Sewage Works	KNP	Malelane	GA		
29.	Biyamiti Rest Camp	Sewage Works	KNP		GA		
30.	New Consort pipeline to Fairview	Mine	Barberton Mines (Pty) Ltd	Barberton	19 June 2015	GA	2020

TABLE 45: APPLICATIONS FOR WATER USE AUTHORISATION

STATUS OF WATER USE LICENSE APPLICATION						
NO.	APPLICANT	SECTOR	AREA	WATER USES	STATUS	PROJECTED COMPLETION DATE
1.	Vantage Gold Fields Pty (Ltd): Barbrook Mine	Mining (Gold)	Louiville (X23H)	21 (a), (b), (c) & (i), (f), (g)	Applicant requested until end of June 2015 to submit outstanding information.	September 2016
2.	Vantage Goldfields (Pty) Ltd: Lily Mine	Mining (Gold)	Louiville (X23H)	21 (a), (b), (g), (j)	Applicant requested until end of June 2015 to submit outstanding information.	September 2016
3.	Charmote Holdings (Pty) Ltd: Scotia Mine	Mining (Talc)	Sheba (X23G)	21 (a), (j)	Application is being finalised at letsema.	June 2016
4.	Charmote Holdings (Pty) Ltd: Sthrathmore Mine	Mining (Magnesite)	Sheba (X24D)	21 (a), (c) & (i), (g), (j)	Application has been returned to the applicant due to lack of information.	December 2016
5.	WPB (Pty) Ltd: WPB Colliery **(not operational)**	Mining (Coal)	Lakenvlei (X21F)	21 (a), (c) & (i), (g), (j)	Application has been finalised and presented at Letsema.	June 2015
6.	Chevron South Africa (Pty) Ltd: Milly's WWTW	Fuel Station and Restaurant	Machadodorp (X21F)	21 (a), (b), (f), (g)	Awaiting outstanding information from the applicant.	June 2016

KOMATI CATCHMENT

TABLE 46: AUTHORISED WATER USE ACTIVITIES

AUTHORISED ACTIVITIES							
NO	**Mines**	**Sector**	**OWNER**	**AREA**	**Status**	**Review**	**Expiry date**
1	Msobo Coal (Pty)Ltd Tselentis Colliery (Ramp 9)	Mining Coal	Msobo Coal	Carolina	Issued (9/09/2013)	09/09/2015	9/09/2019
2	Xstrata SA (PTY) Onverdacht	Mining Coal	Xstrata Alloys/ Glencore Operations South Africa (PTY) LTD	Wonderfontein	Issued (09/12/2009)	09/12/2012	09/12/2018
3	Exxaro Coal (Pty) Ltd North Black Complex: Eerstilingfontein	Mining Coal	Exxaro	Belfast	Issued (28/01/2010)	28/01/2011	28/01/2015 (Expired)
4	Nkomati Anthracites Mine	Mining Coal		Madadeni	Issued 25/10/2012	24/10/2017	24/10/2022
5	Nkomati Joint Venture	Nickel	Nkomati Joint Venture	Badplaas/ Machadodorp	Issued (22/11/2013)	22/11/2013	22/11/2033
6	Msobo Coal (Pty) Ltd: Goedverwachting	Mining Coal	Msobo	Carolina	Issued (14/02/2011)	14/02/2012	14/02/2013 (Expired)
7	Msobo Coal (Pty)Ltd Tselentis Colliery (Ramp 9)	Mining Coal	Msobo Coal	Carolina	Issued (08/08/2013)	08/08/2015	8/08/2019

8	Muhanga Mine (Pty) Ltd: Opgoedenhop	Mining coal	Muhanga Mine	Carolina	Issued (6/03/2013)	06/03/2015	06/03/2023
9	Umsimbithi Coal Mining (Pty) Ltd: Wonderfontein mine Amendment Issued	Mining Coal	Shanduka/ Glencore / Umcebo	Wonderfontein	Issued (27/11/2012 16/08/2015	27/11/2015	27/11/2032
10	Droogvallei Rail Siding Company (Pty) Ltd	Road siding	Droogvallei Rail Siding company	Carolina	Issued (26/02/2011)	26/02/2016	26/02/2031
11	Xstrata Coal Sa (Pty) Ltd Tselentis Colliery	Mining Coal	Msobo Coal	Breyten	Issued (12/02/2011)	12/02/2013	12/02/2015
12	Eastside Coal Company (Pty) Ltd	Mining Coal	Eastside Coal Company (Pty) Ltd	Carolina	Issued (09/12/2009)	09/12/2012	09/12/2019
13	Northern Coal (pty) Ltd Jagtlust	Mining Coal	Northern Coal (Pty) Ltd	Carolina	Issued (11/09/2009)	11/09/2011	11/09/2019
14	Northern Coal (pty) Ltd Mimosa	Mining Coal	Northern Coal (Pty) Ltd	Carolina	Issued (21/02/2012	21/02/2017	21/02/2022
15	Vaalbult Mining Company (Pty) Ltd	Mining coal		Carolina	Issued (18/06/2014)	11/06/2016	18/06/2024
16	Umcebo Mining (Pty)Ltd Klippan, Grootpan and Steel Coal	Mining Coal	Umcebo	Wonderfontein	Issued 20/04/2011	20/04/2011	20/04/2014 Expired

17	Exxaro Coal (Pty) Ltd North Black Complex: the Belfast Project	Mining Coal	Exxaro	Belfast	Issued (26/09/2014)	26/09/2016	26/09/2031
18	TGME Glynslydeburg	Mining Gold	TGME/ Stonewall Mining	Sabie	Issued (11 January 2015)	11/01/2019	11 January 2027)
19	Muhanga Mine (Pty) Ltd: Opgoedenhop	Mining coal	Muhanga Mine	Carolina	Issued (6/03/2013)	06/03/2015	06/03/2023
20	Coastal fuels- Droogvallei Colliery	Mining Coal	Coastal Fuel	Carolina	Issued (11 January 2015	11/01/2018	January 2021
21	TGME: Rietfontein	Mining Gold	TGME/ Stonewall Mining	Sabie	11 January 2015 (Issued)	11/01/2016	January 2024
22	Benicon Mining: Bankfontein Project	Coal Mine	To be investigated	To be investigated	1 December 2014	01/12/16	December 2019
23	Annalisa mine and industrial services	Coal Mine	Lefa Coal	Wonderfontein	08 September 2013	08/04/2015	September 2016
24	Pembani Coal	Coal Mine	Pembani Coal	Carolina	01/04/2011	01/04/2013	01/04/2021
25	Northern Coal: Weltevreden Mine	Coal Mine	Northern Coal	Carolina	19 April 2015	April 2017	19 April 2023
26	Coastal fuels- Droogvallei Colliery	Mining Coal	Coastal Fuel	Carolina	Issued (11 January 2015	11/01/2018	January 2021

TABLE 47: APPLICATION FOR WATER USE AUTHORISATION

STATUS OF WATER USE LICENCE APPLICATIONS						
No	**APPLICANT**	**SECTOR**	**DATE SUBMITTED**	**WATER USES**	**STATUS**	**PROJECTED DATE OF COMPLETION**
1	Ikoti Coal **(Not operational)**	Mining	March 2012	(a),(b) (c) (i), (j) and (g)	Declined due to insufficient information	Completed
2	Pembani Coal	Mining	June 2015	(a), (c), (i) and (g)	Awaiting Civil Comments	November 2015
3	Eastside Colliery	Mining	November 2013	(a), (b), (c) (i) and (g)	Applicant submitted outstanding information and assessment is being done. Specialist inputs received Drafting RoR and Licence	November 2015
4	Op Goeden Hoop Colliery (Not operational)	Mining	22 August 2014	(a), (c) (i), (f) and (g)	Additional information received from the applicant. The application has been circulated to different specialist (Civil design, Geo) for comments. Only (c) and (i) comments received	December 2015
5	Strathrae Colliery	Mining	May 2011	(a),(g) and (j)	Withdrawn by the applicant	Withdrawn
6	Muhanga Mines (pty)ltd-Op goedenhop (Amendment)	Coal Mining	August 2014	(a),(g) & (J)	Awaiting written comments from Dr. Muelenbeld	November 2015
7	Umsimbithi Colliery	Coal	March 2014	(c);(i) &(g)	Application presented and recommended for issuance.	Completed: 16

	(Amendment)	Mining			Waiting for the approval signature by the DG of DWS	August 2015
8	Cozispot(PTY) LTD (Not operational)	Coal Mining	December 2014	(a);(c);(g);(i) & (j)	License finalized, and presented and recommended by for issuance by WUAAAC.	Awaiting Approval by the DG
9	Western Crowd Properties (pty)ltd Onbekend	Coal Mining	November 2012	(c),(i),(g) & (j)	Civil & Geohydrology comments requested	December 2015
10	Msobo coal (pty) ltd-Verkeedepan (Not operational)	Coal Mining	May 2012	(a),(c),(i)(g) & (j)	Awaiting additional civil design information	October 2015

USUTHU CATCHMENT

TABLE 48: AUTHORISED WATER USE ACTIVITIES

No.	Activity	Sector	Owner	Area	Date Issued	Review Period/Date	Expiry Date
1.	Kangra Coal Panbult siding	Mining	Kangra Coal	Usuthu	31 July 2012	5 Years	31 July 2032

TABLE 49: APPLICATION FOR WATER USE AUTHORISATION

No.	Activity	Sector	Date Submitted	**Water Uses**	**Status**	**Projected Date Of Completion**
1.	Mkhondo Local Municipality; Piet Retief Waste Water Treatment Works.	Local governance.	17 July, 2015	(c), (i), (f) and (g)	Under assessment	October 2015
2.	Kangra Coal Nooitgezien, Rooikop and (Maquasa East &West)	Mining	18 May 2009	a),(c), (g), (i) and (j)	Applicant requested to submit outstanding information on section 21 c & i.	Application is assessed by DWS head office. Follow ups will be made by the Usuthu office on projected date.
3.	Mahamba WWTW	National Dept. of Public Works	2014	g	Under assessment	November 2015

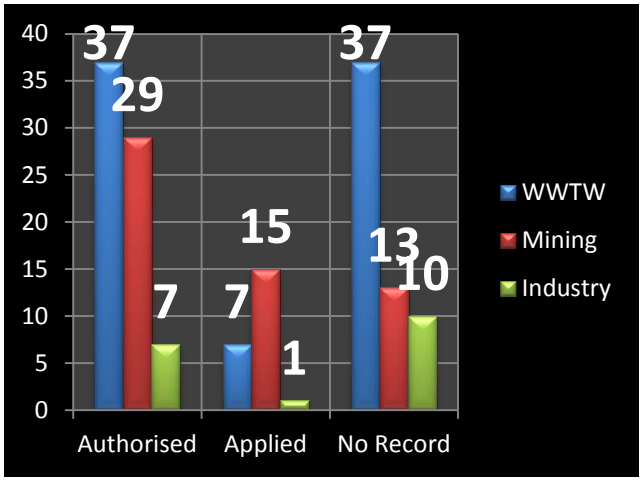


Figure 30: The number of water quality related activities represented per sector within the Inkomati-Usuthu Water Management Area.

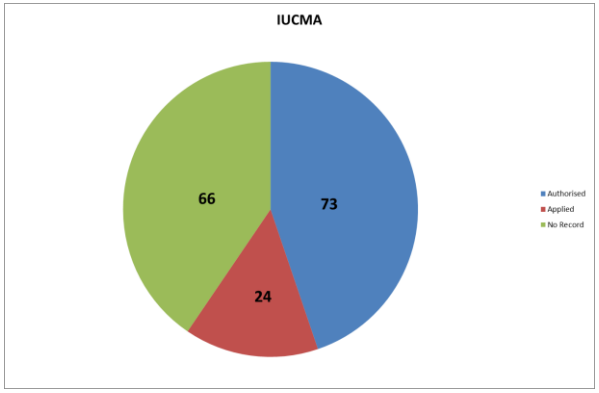


Figure 31: The authorisation status of all known water quality related activities in the Inkomati-Usuthu Water Management Area shown in percentage.

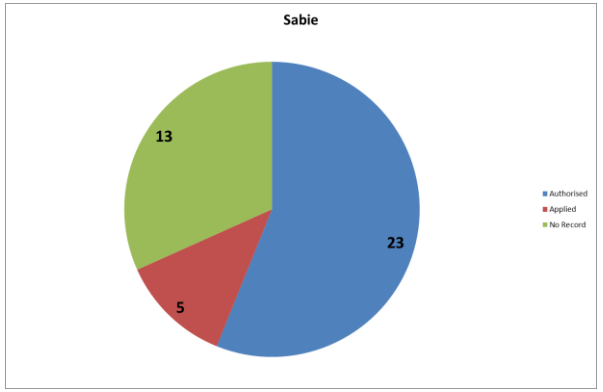


Figure 32: The percentage authorisation status of all known discharge and disposal water users in the Sabie-Sand Catchment.

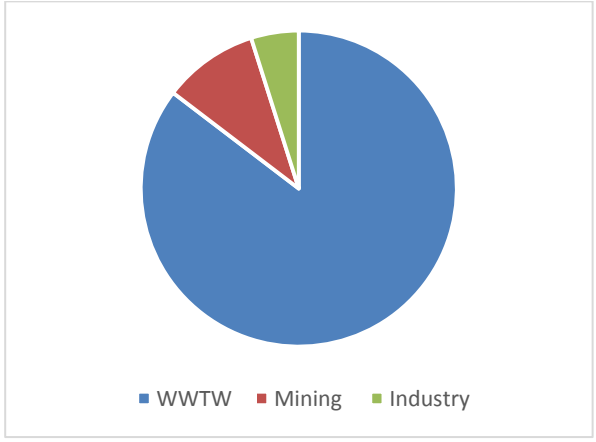


Figure 33: The percentage sectoral representation of discharge and disposal water users in the Sabie-Sand Catchment.

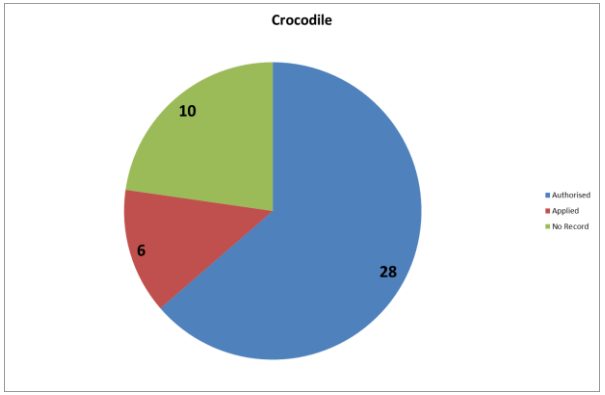


Figure 34: The percentage authorisation status of all known discharge and disposal water users in the Crocodile Catchment.

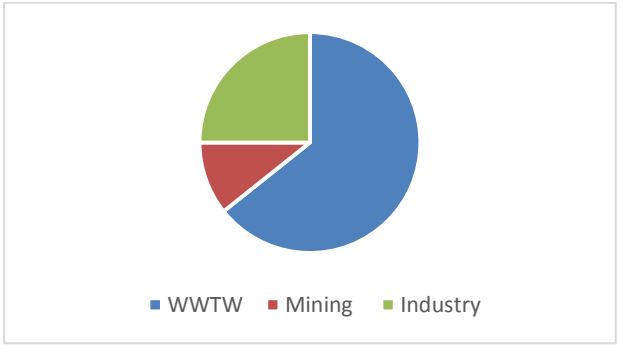


Figure 35: The percentage sectoral representation of discharge and disposal water users in the Crocodile Catchment.

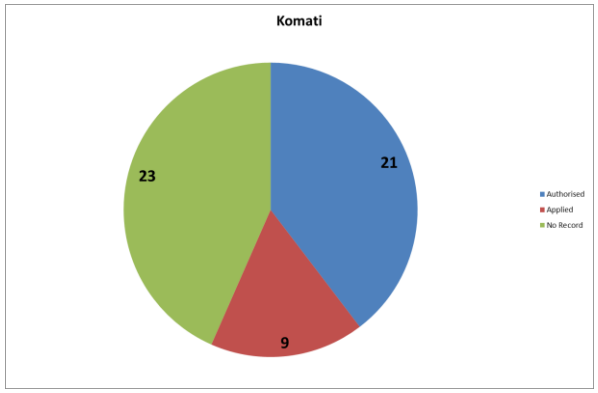


Figure 36: The percentage authorisation status of all known discharge and disposal water users in the Komati Catchment.

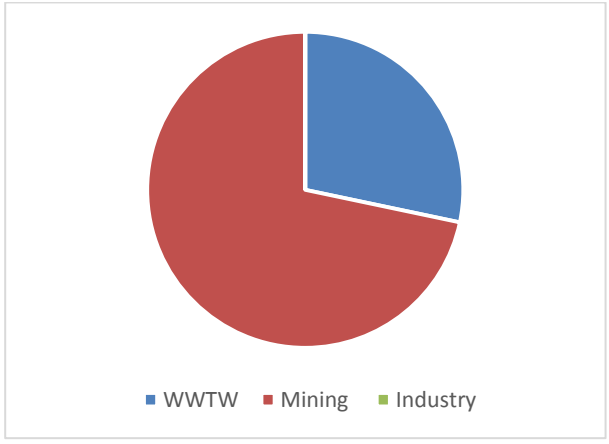


Figure 37: The percentage sectoral representation of discharge and disposal water users in the Komati Catchment.

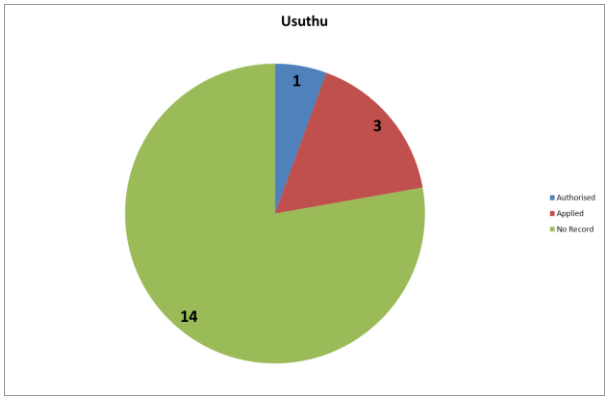


Figure 38: The percentage authorisation status of all known discharge and disposal water users in the Usuthu Catchment.

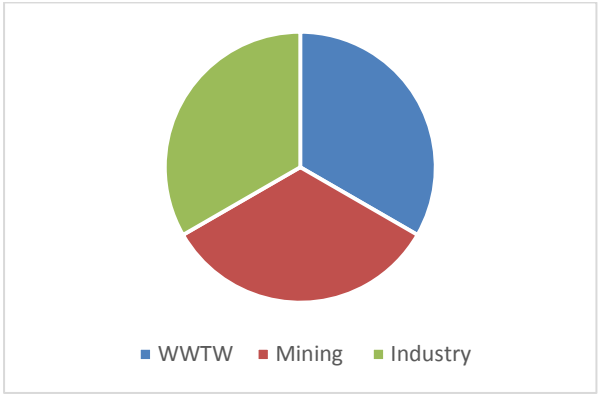


Figure 39: The percentage sectoral representation of discharge and disposal water users in the Usuthu Catchment.