

VAAL RIVER INTERVENTION



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA



ERWAT
EXCELLENCE IN WASTEWATER



cooperative governance

Department:
Cooperative Governance
REPUBLIC OF SOUTH AFRICA



GAUTENG PROVINCE

CO-OPERATIVE GOVERNANCE AND
TRADITIONAL AFFAIRS
REPUBLIC OF SOUTH AFRICA



RAND WATER

Contents

- Problem Statement
- Objectives
- Overall Findings
- Implementation Plan
- Phased Approach
- Governance structure
- Work packages
- Cash Flow Requirements
- VRSI project management approach
- Critical Success Factors
- Risk and mitigation
- Conclusion



Problem Statement

Impact on the Vaal River

- Discharge of non-compliant wastewater effluent
- Negative impact on river ecology and ecosystems

Impact on socio-economic growth

- Design treatment capacity at its limit
- Delays in implementation of housing development investments (i.e. Savannah City and River City)
- Negative environmental and health impact

Infrastructure

- Aged infrastructure over 60 years old
- Lack of operation and maintenance investment
- Vandalism and theft

OBJECTIVES

Vaal River Intervention Implementation Plan

- Secure and safeguard the infrastructure
- Repair bulk network to eliminate current spillages
- Repair key and critical pump stations and rising mains
- Refurbish wastewater treatment works in an attempt to comply with discharge license conditions
- Achieve operation & maintenance requirements
- Minimize and stop Vaal river pollution

OVERALL FINDINGS



Safety & Security

Cable theft at pump stations and WWTWs

Stolen steel grid walkways in pump stations making them **inaccessible and unsafe for O&M**

Uncontrolled access to some of the pump stations



Bulk Sewer Network Spillages

Major spills in the bulk network

Blocked bulk lines due to foreign objects (**rocks, solid waste, disposable nappies and sand**)

Damaged manholes

Constricted pipelines

Pipe replacement & repairs

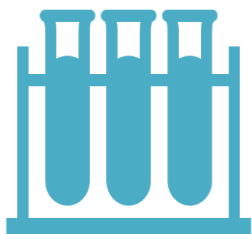


Critical Pump Stations & Rising Mains

Collector pump stations not operational leading to spillages in the Vaal River Catchment

Aged rising mains in need of replacement

OVERALL FINDINGS



Refurbishment of WWTW

Flow arriving at the WWTW has decreased dramatically due to spillages in the bulk sewer network and non operational pump stations

High extraneous flows leads to **hydraulic overloading** of the WWTW

Aged existing modules in need of refurbishment



Operation & Maintenance

Limited staff complement of 21 to operate and maintain the sewer network, pump stations and WWTW

Fleet of 7 bakkies and 2 Jet Vac truck which are currently out of commission to undertake the O&M work

No spares and consumables (fuel, oil, parts, etc.)

Suppliers owed money – so cannot procure any more services, order spares or repairs

Rand Water operations support has stopped



OVERALL FINDING

Implementation Plan

VRI

- **Optimise operation of critical pump stations**
- **Replace rising mains of the critical pump stations**
- **Pipe repairs and unblocking key bulk mains**
- **Refurbish existing WWTW**

SRSS

- **Upgrade and build new pump stations part of the SRSS**
- **Build new bulk pipelines replacement**
- **Gravity Mains**
- **Rising Mains**

Emfuleni LM

- **Operation and Maintenance of all pump stations and WWTW**
- **Continued refurbishment of remaining pump stations with the WSIG funds**
- **Pipe repairs and unblocking of the reticulation network through existing “As and When Contracts”**
- **Long term planning for replacement and refurbishment of aged network infrastructure**

The intention is to eliminate the spillages at PS2, 8, 9 & 10 by June 2020 through short term pollution control interventions. Ensure that this cluster of pipelines and pump stations and the waste water treatment works of operational by February 2021.

Implementation Plan

Safety & Security

- Improved security teams deployed to key and frequently vandalised pump stations
- Upgrade fencing, lighting and controlled access to these pump stations

Bulk Network Unblocking & Repairs

- Priority 1 bulk lines in all catchments that are the major cause for flow not arriving at WWTW
- Priority 2 bulk lines in all catchments that are spilling in the community
- Priority 3 bulk lines that need to be cleaned to accommodate growth

Operation & Maintenance

- ERWAT to support ELM with planning and resources requirements for operation and maintenance

PHASED APPROACH

Pump Stations (X 16)

- ELM (VRI)
 - PS 7,8/8A,9
- VRI
 - PS 1, 2/2A, 4/4A, 5, 6, 10, 16, 17, 20
- SRSS (DHS)
 - PS 34

Rising Mains (x 7)

- ELM (MIG)
 - PS 8 to PS 2
- VRI
 - PS 5 to 10, PS 10 to 2 stilling box, PS 2 to Leeuwkuil WWTW, PS 4 to Leeuwkuil WWTW, PS 1 to Leeuwkuil WWTW
- SRSS (DHS) PS 10 stilling box to PS 2

Pipe Replacement (x 8)

- ELM (MIG)
 - Union street, Lebohang School in Boipatong, Houtkop to Unitaspark, Three Rivers Eastand Sonlanpark, Zonderwater to Sebokeng WWTW
- VRI
 - Evaton West
 - Johandeo bulk line
 - Section North of Bophelong along R533 to Rietspruit WWTW
 - Flora Gardens to PS 38

Unblocking and Pipe Repairs (X 26)

- 12 Priority 1 lines directly impacting the Vaal River Catchment
- 5 Priority 2 lines impacting the community
- 9 Priority 3 lines needing cleaning to accommodate growth
- Replacement of all manholes with lockable mechanism

CRITICAL SUCCESS FACTORS CONT...

Governance arrangements

Political Steering Committee

(Chaired by DWS Minister-DWS or Premier or DWS Deputy Minister delegated)

Members: Minister-DWS, Minister-COGTA, Deputy Minister (DWS), Deputy Minister-COGTA, Premier, MEC: COGTA, Mayors and MMCs (Sedibeng, MidVaal, Lesedi and Emfuleni), IAs Chair persons

P.S.C.

Project Steering Committee

(Chaired by DWS DG or DDG delegated)

Members: DG-DWS, DG-COGTA, DDG-IBOM, DG-GP, MISA-CEO, HOD-GP COGTA, HOD-GP HS, IAs-CEOs, MMs (Sedibeng, MidVaal, Lesedi and Emfuleni), Head of Metsi-A-Lekoa

P.S.C.

Technical Steering Committee

(Chaired by DDG-IBOM or Gauteng Provincial Head or Director delegated)

Members: DDG-IBOM, Prov. Head-GP, DIR-GP Infra, MISA-GP PROV HEAD, CD-GP COGTA, CD-GP HS, IAs-COOs, TECH.DIR (Sedibeng, MidVaal, Lesedi and Emfuleni))

T.S.C.

Project Office and Work Streams (Monthly Community engagements (SAVE the Vaal and other stakeholders), Technical support teams including Metsi, Audit, O&M by Metsi and all support etc)

Work Packages

Item	Scope	Estimated Duration Months
1	Sebokeng WWTW BNR Mod 3	12
2	Sebokeng WWTW BNR Mod 4	12
3	Sebokeng WWTW BNR Mod 5	12
4	Leeuwkuil WWTW Bio-filter and BNR	24
5	Rietspruit WWTW Bio-filter and BNR	24
6	Gravity and Rising main Leeuwkuil	12
7	Gravity and Rising main Rietspruit	12
8	Gravity and Rising main Sebokeng	12
9	Pump Station 2	6
10	Pump Station 5	6
11	Pump Station 8	6
12	Pump Station 9	6
13	Pump Station 10	6
14	Programme Portfolio Office	24
15	Assessment of waste water plants discharging into the Vaal river system	4
16	VRSI Communication plan rollout	12

Work Packages

Item	Scope	Estimated Duration Months
17	Security plan (Perimeter fencing around 44 pump stations, Sebokeng, Rietspruit, Leeuwkuil and Meyerton WWTW's including CCTV camera, guard house in all pump stations)	6
18	50 Generators for all 44 pump stations and Sebokeng, Rietspruit, Leeuwkuil & Meyerton WWTW's	2
19	The rest of 39 pump stations (Bill of Quantities are being finalised)	6
20	Meyerton WWTW Bio-filter and BNR	24
21	Gravity and Rising main Meyerton	12
22	Treated effluent for agriculture	24
23	Insurance of all infrastructure under construction	24
24	600 community workers and associated tools of trade (300 community workers and 300 WOL graduates)	6
25	Unblocking, pipe repairs and manhole replacement	24
26	Security (4 waste water treatment plants and 44 pump stations)	24
TOTAL		

PRIORITY CASH FLOW REQUIREMENTS

Description		Cost Estimate
Pipe replacement program (Gravity & Rising mains)	R	315 346 472.58
Critical Pump stations (8, 9, 10 & 2)	R	35 687 749.33
Refurbishment of Three (3) WWTW	R	647 238 305.88
Total CAPEX	R	998 272 527.79

The costing will have to be prioritised to address the critical aspects of the short term scope of pollution prevention by the planned June 2020 deadline.

VRSI PROJECT MANAGEMENT APPROACH

- ERWAT was appointed for 12 months ending June 2020 for:
 - Gravity and Rising main: Leakages and deficiencies in the sewer network system replaced and repaired.
 - Pump stations: Prioritize upgrade of forty-four (44) pump stations.
 - Wastewater Treatment Works: All three (3) treatment plants should be refurbished to optimal functionality.
- Appointment contract value R141 mil
- Work done include unblocking, general labour for cleaning and security
- All contracts appointed by ERWAT will be handed over to DWS

PROGRESS TO DATE

- ERWAT started working in the unblocking and repair project in December 2019
- A total of 10 Contractors were appointed to unblock sewer lines
- Out of 27.4 km of bulk lines identified in Sebokeng Catchment, 25.236 km have been cleared.
- A total of 379 manholes cleaned to date in Sebokeng Catchment
- A total of 46 manhole covers replaced on the reticulation network lines to date in Sebokeng Catchment
- A total of 14 manholes replaced during unblocking of bulk lines in Sebokeng Catchment
- Flow of sewer in Sebokeng WWTW increased due to 25.236 km of pipeline unblocked from 18 ml/d to 120 ml/d.
- Almost 50 tons of rubble removed from the bulk lines and network to date
- Unblocking of bulk lines in Leeuwkuil Catchment started mid-April and out of 15.8 km of bulk lines identified, only 1 km was completed to date
- A total of 24 manholes cleaned in Leeuwkuil catchment
- Flow of sewer in Rietspruit WWTW has increased from 19 ml/d to 43 ml/d
- The Department is taking over the management of the project because of the slow pace of delivery.
- According to Rand Water Module 6 of Sebokeng plant will be commissioned end of July 2020, this commissioning is subject to no community unrest.

VRSI PROJECT MANAGEMENT APPROACH WAY FORWARD

- ERWAT to remain as one of the stakeholders at Political Steering Committee and at TSC
- ERWAT has been appointed by Emfuleni LM to do their O&M
- DWS working with the intervention team has come up with BOQs
- DWS to advertise all BOQs
- Appoint Project Portfolio Office to assist DWS in the management of the project at a reduced cost than the IA fee
- Metsi-A-Lekoa to be capacitated to take over the SRSS scheme when the intervention ends

CRITICAL SUCCESS FACTORS

- Technical Task Team established to drive the process (include all stakeholders, i.e. DWS, ELM, etc.)
- Effective management of community expectations of the project
- Procurement Strategy to be flexible, quick and efficient
- Adequate security to be provided (Armed guards, with response units)
- Consistent power supply (or adequate back-up power is necessary)
- Operation & Maintenance support after rehabilitation is vital
- Funding to be available to meet cash flow requirements
- Other key technical staff, Environmentalist, OHS Agent and a Quantity Surveyor

CRITICAL SUCCESS FACTORS CONT...

- The community closed the Sebokeng site because they were demanding that the **600 community employees** start work under lockdown level 4. The community was addressed that only at level 3 will their work start. This was done in order to comply with COVID-19 lockdown regulations.
- The community was demanding that they start work on the 01 June 2020. The **Minister made PPE available** hence the community was allowed to work by ERWAT.
- The future possible unrest is that the community is demanding that
 - The CO-OPS be trained and given work now
 - All the work should be given to Sebokeng area contractors without following PFMA processes now
 - Module 7 to start right away
 - 2250 People that Minister Nkwinti promised to the community must be trained as security guards. Minister Nkwinti did not make this promise however he promised the community the NARISEC training programme for 2000 community members. In late 2019 the community opted to be trained in vocational skills i.e. plumbing, brick laying, plastering etc

Risks & Mitigation

Risks	Mitigations
Governance	<ul style="list-style-type: none"> • Improve oversight on projects & contracts
Operation & Maintenance	<ul style="list-style-type: none"> • Prioritise appointment of critical staff • Effective monitoring of contractors
Budget	<ul style="list-style-type: none"> • Improve financial management controls • Adequate allocation of budget for infrastructure
Delays in procurement	<ul style="list-style-type: none"> • Ensure quick appointment of competent service providers
Contract over run	<ul style="list-style-type: none"> • Effective contract management
Stakeholder relationship	<ul style="list-style-type: none"> • Development and implementation of stakeholder management plan for the programme
Vandalism	<ul style="list-style-type: none"> • Request declaration of WTTW as National key points • Performance of security assessment and development of security strategy
Project stoppages and unrests	<ul style="list-style-type: none"> • Implementation of stakeholder management plan (Educational & awareness campaigns) • Community participation

Conclusion



Total cost of R 2,2 billion required to have a **sustainable impact** on the Vaal River Catchment within Emfuleni LM



Funding to address Emfuleni LM's O&M requirements is not included. **Continued O&M is key to sustain the impact of the intervention.**



12-month period is insufficient to make a sustainable impact on the Phase 1 scope of works (PS2, 8, 9, 10, Bulk Water Pipeline and WWTWs)



Detail design of the SRSS transfer scheme and regional WWTW is to be looked into

Thank you



WATER IS LIFE - SANITATION IS DIGNITY



water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA