



FIGURE 4: AMAOTI WATER RESOURCE (UMGENI WATER WEBSITE)

## 6.2. EXISTING WATER NETWORK

### 6.2.1. Overview

The township of Amaoti is partially serviced with running water where the network does not follow a specific route, and therefore most stands have been positioned on top of the existing network as illustrated in **Figure 5**. This information was obtained from eThekwini GIS.

As some households appear to have access to running water, storage containers are still required for intermittent water supply. Also, the water quality and pressure are compromised due to broken or leaking distribution pipes resulting from water theft and/or illegal connections as illustrated in **Figure 6**, Image 2.

Due to the increasing population within the area, the municipality struggles to keep up with maintaining current services and providing additional basic public services.



FIGURE 5: SAMPLE OF AMAOTI INTERNAL WATER NETWORK (ETHEKWINI GIS VIEW)

### 6.2.2. Current Conditions

Currently, water has been provided to the community at designated water points scattered throughout the development. As seen in **Figure 6**, the existing reticulation and infrastructure are damaged, or illegal connection made to.



FIGURE 6: ACCESS OF WATER IN AMAOTI INFORMAL SETTLEMENT

**Figure 6** represents shared infrastructure which is not properly maintained and looked after, due to the excessive use by the community. Where water is not available, natural streams and accessible ground water supplies are used.

### 6.2.3. Outstanding Information

Information required to proceed with the bulk services investigation report will include the updated water layouts and as-built drawings for the work already implemented. Pipe networks indicating reservoirs, pipeline sizes and their capacities will, therefore, be essential for bulk investigation.

A thorough investigation will be conducted on the existing infrastructure, to determine where the network needs to be upgraded and/or replaced. To establish the final water layout arrangement, the proposed township layout will be required.

### 6.2.4. Future Procedures

As stated previously, the project is seen as a catalytic project, which is sensitive to the residents of Amaoti, as for some time the community have been promised basic services.

The enactment of the project will be phased to simplify planning, design, and implementation, making it easier to effectively manage and to improve the overall quality of the project. This will also accelerate the process, especially in the case of environmental authorisation, which is known to be a time-consuming task.

We therefore propose phasing of the project as follow:

- Phasing will be defined by Water and Sanitation, in areas with sufficient capacities;
- Phasing will be coordinated in an uphill type pattern to accommodate sanitation; and
- Phasing will be dependent on the proposed township layout.

Further discussion on the phasing will be shared within the Status-Quo report for Sanitation.

The detailed bulk services investigation will be treated as a separate task which will align with the overall phasing planned. The objective of the investigation will be to establish the status and capacity of the existing bulk services and requirements for the development.

As the social-political factors play a vital role in the area, phasing will be reviewed and amended based on the requirements.

## 7. PROVISIONAL MILESTONES

To ensure that the project progresses on time and within budget, it is of utmost importance that SCIP and the Project Managers and/or the client are in continuous liaison and compliance to timeframes. All communication relating to the project will be through the project manager, important information will be formal and written and verbal conversations and agreements will be followed up by written communication for confirmation (email or letter).

The provisional milestones have been assembled as indicated in **Table 3**.

**TABLE 3: PROVISIONAL MILESTONES**

STAGE	MILESTONE	MILESTONE DESCRIPTION	DELIVERABLES	DURATION (MONTHS)	TARGET	STATUS / COMMENTS
<b>Stage 1: Inception</b>	Project Scoping	Establish client requirements, preferences, and project brief, including scope of work, programme, risks, and opportunities.	Inception Report	1	Feb-20	Complete
<b>Stage 2: Feasibility Studies</b>	Status-Quo Analysis	Investigate existing municipal services and capacities, layout in line existing settlements and the proposed development including risks and recommendations.	Water and Sewer Reports	2	Apr-20	Complete
			Roads and Stormwater Reports			
			Electrical Report	3	May-20	<ul style="list-style-type: none"> <li>Active with the collation of information.</li> <li>Visual inspections required.</li> </ul>
	Transport Planning	Establish requirements for both the existing settlements and the proposed development.	Traffic Impact Assessment Report	3	Jul-20*	<ul style="list-style-type: none"> <li>Active with a collation of information.</li> </ul>
			Site Traffic Assessment Report	3	Sep-20*	<ul style="list-style-type: none"> <li>Township Layout required.</li> </ul>
	Flood-Line	Establish a flood plain within which development will be prohibited.	Flood-Line Demarcation	2	May-20	Active
	Bulk Investigation	Establish the status and capacity of the existing bulk services and identify areas of opportunities and develop a strategy for the implementation.	Water and Sewer Reports	2	Jun-20*	<ul style="list-style-type: none"> <li>Active with a collation of information.</li> <li>Existing bulk infrastructure conditions and capacities required.</li> <li>Township Layout required.</li> <li>Visual inspections required.</li> </ul>
			Roads and Stormwater Reports			
Electrical Report				Jul-20*		

STAGE	MILESTONE	MILESTONE DESCRIPTION	DELIVERABLES	DURATION (MONTHS)	TARGET	STATUS / COMMENTS
Stage 3: Concept and Viability	Preliminary Design	Collection of all data relevant to the project, investigate options for effective performance and produce concept designs and propose project implementation phasing.	Drawings and Reports: Water and Sewer	4	Oct-20*	<ul style="list-style-type: none"> <li>Active with a collation of information.</li> <li>Draft Township Layout required.</li> <li>Survey required.</li> </ul>
			Drawings and Reports: Roads and Stormwater			
			Drawings and Report: Electricity			
			Project Phasing Plan			
Stage 4: Design Development	Detail Design	Undertake detailed design of the new facility and associated requirements, plan construction of the project, produce drawings, specifications, and tender documentation, adjudicate tenders, and recommend contract appointments.	Approved Drawings and Cost Estimate: Water and Sewer	4	Mar-21*	<ul style="list-style-type: none"> <li>Approved Township Layout required.</li> <li>Approval of Preliminary Design and Environmental Authorisation required.</li> </ul>
			Approved Drawings and Cost Estimate: Roads and Stormwater			
			Approved Drawings and Cost Estimate: Electricity			
			Project Phasing Plan			
Stage 5: Close-Out	Project completion	Prepare a completion report which will entail the summary of the project findings and recommendations.	Close-Out Report	2	May-20*	All the above

*(\*) will be influenced by inputs from other disciplines and the turnaround time from the relevant authorities.*

It should be borne in mind that the visual inspections, which SCIP began in March, was put on hold due the COVID-19 lockdown period but will resume as soon as possible after clearance has been given by the government.

## 8. POTENTIAL RISKS

Table 4 is a live risk register prepared to identify and mitigate potential challenges.

TABLE 4: POTENTIAL RISKS

RISK	IMPACT	CONTINGENCY PLAN	PROBABILITY
<b>Environmental authorization</b>	Reduction of land to be developed. Delays.	Residential 3 and 4 developments. The municipality and the client to facilitate.	<i>Medium</i>
<b>Town planning services</b>	Delays in circulation.	Municipality to prioritize the project.	<i>Medium</i>
<b>Flood plain</b>	Reduced area of development. Location of structures within the flood plain.	Residential 3 and 4 developments.	<i>Medium</i>
<b>Multi-year implementation</b>	Budget, change in priorities Change in the executive.	Sufficient contingency reserves.	<i>High</i>
<b>Red tape/Bureaucracy</b>	Processes to make decisions. Delays.		<i>High</i>
<b>Executive</b>	The conflict between executives. Executive turnover (leaving the company).		<i>High</i>
<b>Stakeholders</b>	Stakeholder conflicts. Stakeholders ignore communications. Stakeholder turnover.	Social facilitation.	<i>Medium</i>
<b>Resources</b>	Resources turnover. Team dynamics (conflicts, etc.). Unethical conduct.		<i>Medium</i>
<b>Engineering designs</b>	Delays from stakeholders' approval.		<i>Low</i>
<b>Decisions making</b>	Turnaround time. The ambiguity of decisions.		<i>High</i>
<b>Time</b>	Overly optimistic schedule.		<i>Medium</i>
<b>External</b>	Force majeure (e.g. act of nature). Technical change. Political change (local and federal). Community unrest.		<i>High</i>

## 9. CONCLUSION

The proposed upgrade of informal settlements will be beneficial to the residents of Amaoti and the surrounding areas. The project will demonstrate sustainability over the long term, post-project completion as well as promote and impact on the creation of sustainable integrated human settlements.

The most challenging factors which may cause project delays are the topography and the possible relocation of the residents.

The existing bulk water infrastructure can at this stage accommodate part of the development as indicated in Section 6.2.1. The upgrade will be commissioned in line with the development requirements and/or municipality.

As informal populations grow, the need for water services grows accordingly. It is challenging to find straightforward solutions to the service problems identified in this report. Solutions must meet specific circumstances and must be implemented with relatively limited technical resources. A thorough investigation of the existing supply arrangements is required.

## 10. REFERENCES

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