5. WATER SERVICES INFRASTRUCTURE PROFILE

5.1 Existing water services infrastructure

ZDM has done extensive work on the development of a database that will serve as an asset register, but also to be used as the basis for the development of an asset management system and to capture asset related information electronically for ongoing use. The system has been named 'MANZI' and access can be gained on the ZDM website at www.zululand.org.za once the user has been issued with a username and password.

Table 5.1(a) below provides a brief overview of the schemes in the district that have been captured on the MANZI system and a summary of the infrastructure under consideration, as well as a rough estimate of the value of assets. These figures will be refined over time once the asset management system has been rolled out.

Table 5.1(a): Summary of schemes in the district

Summary Data	LOS	Total
Number of Schemes	Above RDP - Urban	14
	Above RDP - Rural	56
	RDP	111
	Rudimentary	135
	TOTAL SCHEMES	**316**

Figures 5.1 (a), (b) and (c) and Table 5.1 (b) below show examples of infrastructure data that is currently available on the GIS system and also on MANZI. Although some gaps still exist in the infrastructure information ZDM is working on getting all information gaps systematically updated.

Table 5.1 (b): Summary of infrastructure components available on the ZDM GIS system

Summary Data	LOS	Total
Number of Schemes	Above RDP - Urban	14
	Above RDP - Rural	56
	RDP	111
	Rudimentary	135
	TOTAL SCHEMES	**316**

Table A.3f

Summary Data	Description	Total
Pipelines	Bulk	998.4 km
	Reticulation	5 689.8 km
Installations	Yard Connection	25 341
	StandPipe - Barrel	302
	StandPipe - Communal	4 792
	Electrical Point	0
	Valve	12 807
	Meter	1268
	Bulk Metering Points	253
	Handpump	0
	Pump	23
	Pump Station	116
	Source / Abstraction	489
	Break-pressure Tank	397
	Storage - Jojo	205
	Storage - Reservoir	730
	Treatment (WTW, Sand filters etc)	53
Replacement Value	Civil	R 1 988 605 029.79
	Mechanical	R 580 779 627.48
	Electrical	R 229 914 773.89
	Telemetry	R 12 255 225.37

Figure 5.1 (a): Existing water infrastructure in the district

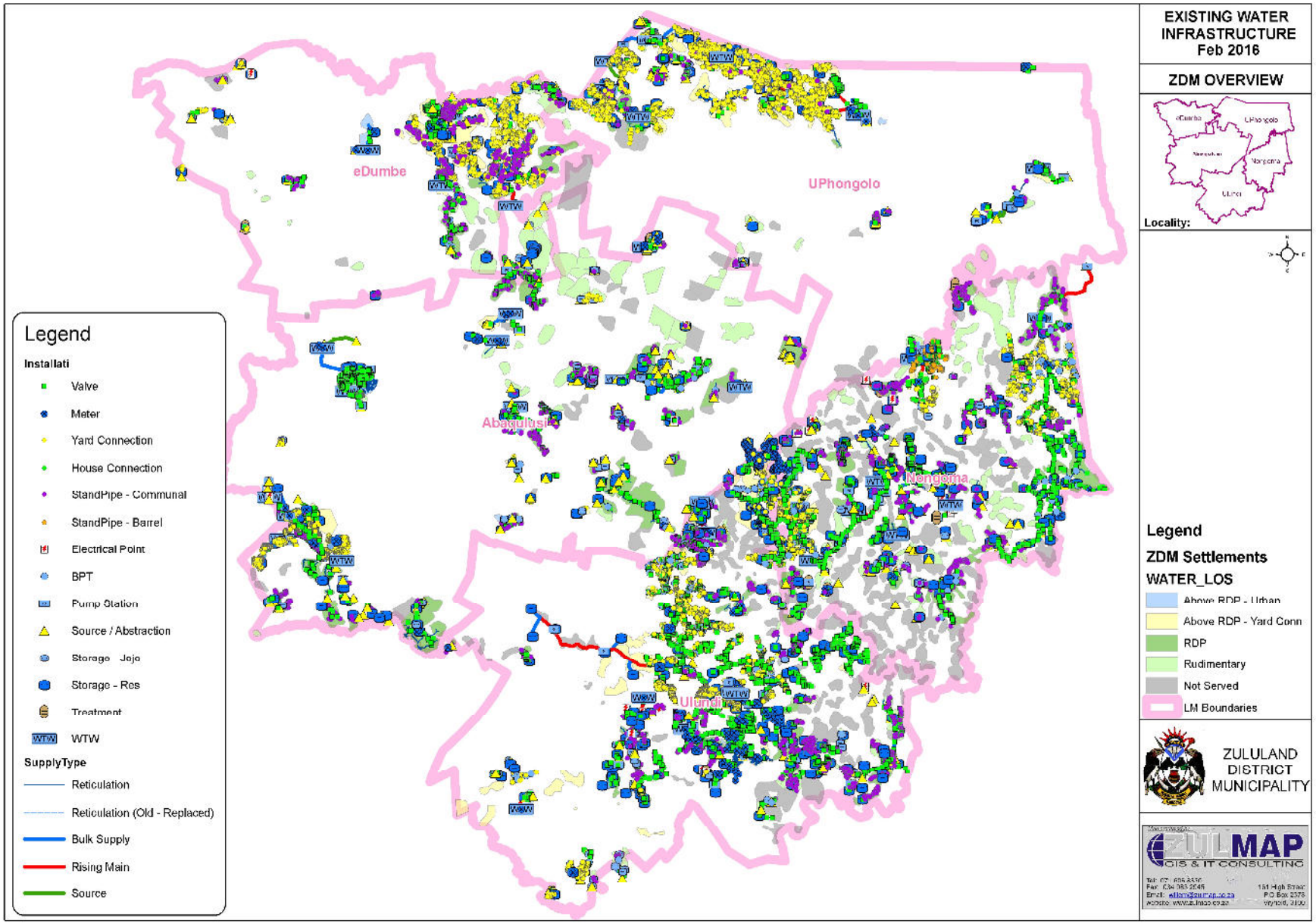


Figure 5.1 (b): Typical Bulk Water Scheme details available on the ZDM GIS database (Ulundi Area)

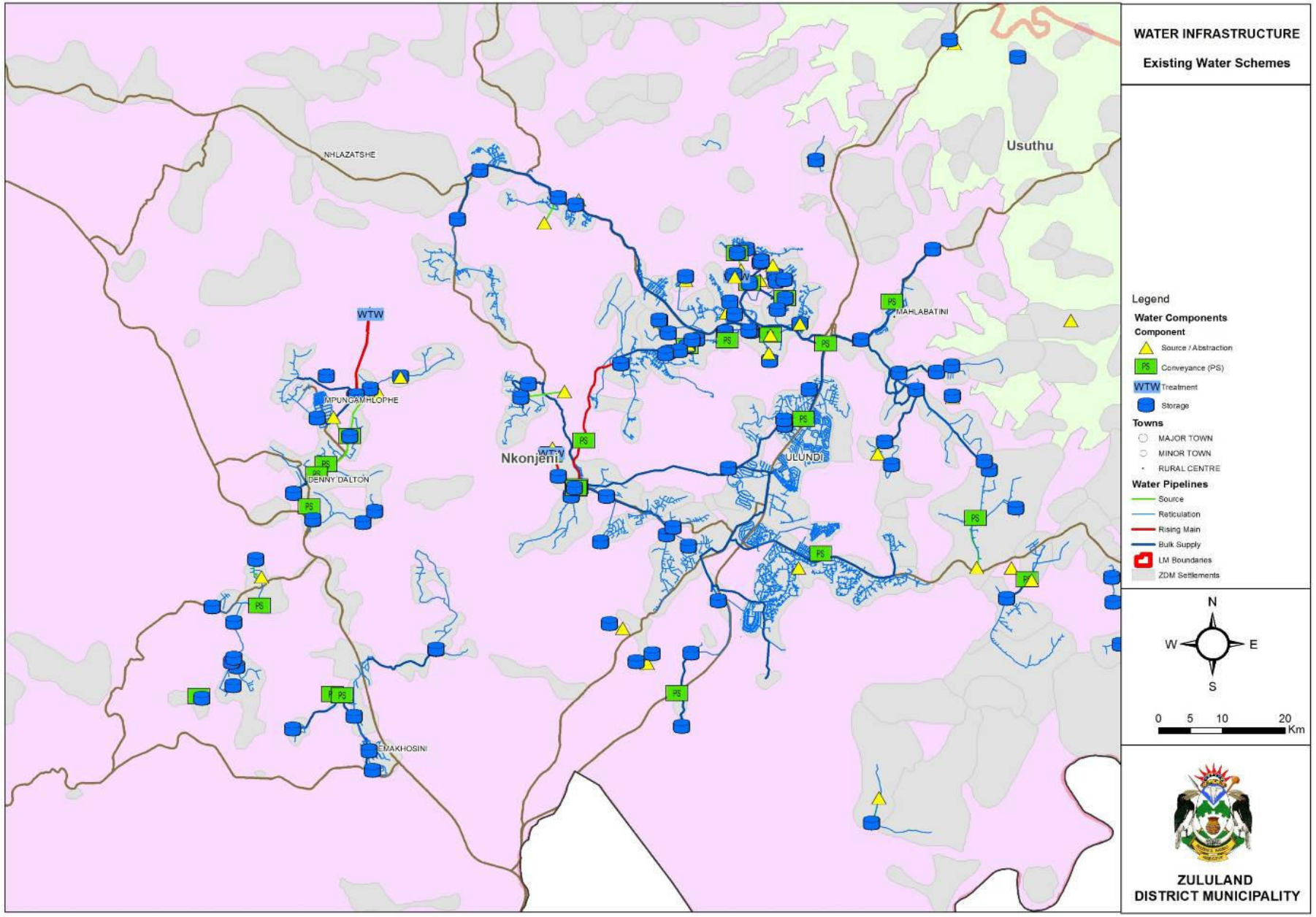
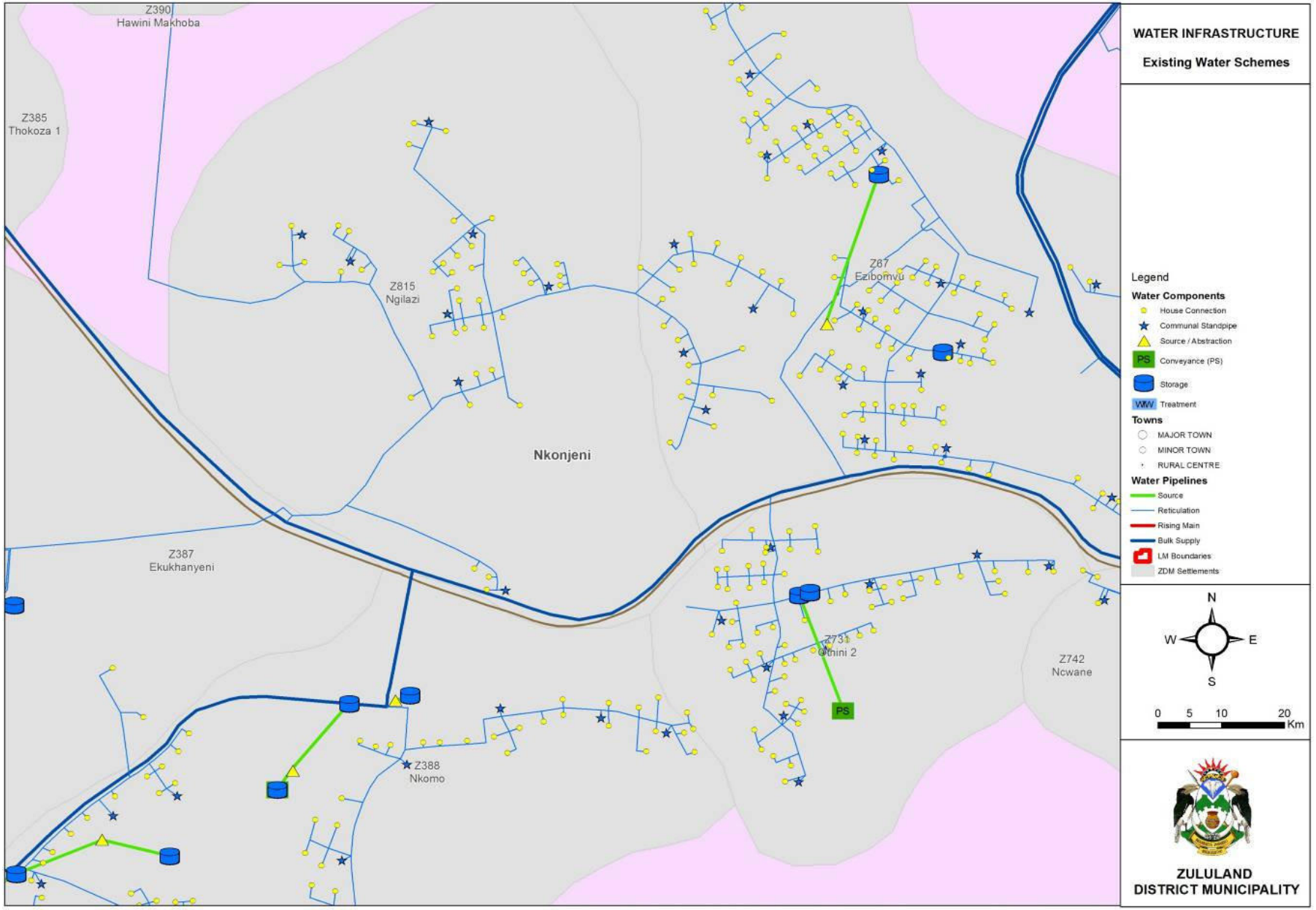
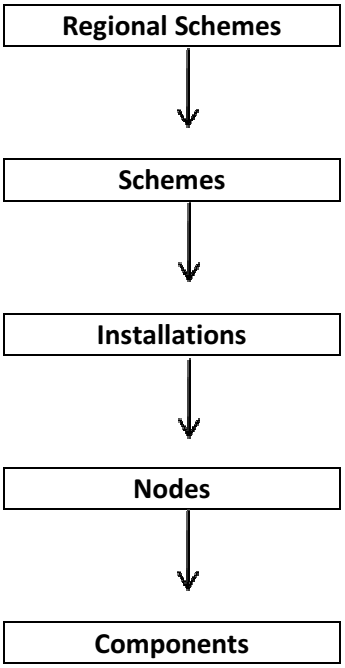


Figure 5.1 (c): Typical Water Reticulation details available on the ZDM GIS database (Nkonjeni Regional Scheme Area)



The asset data in the MANZI system has been structured in a specific data hierarchy as indicated below:

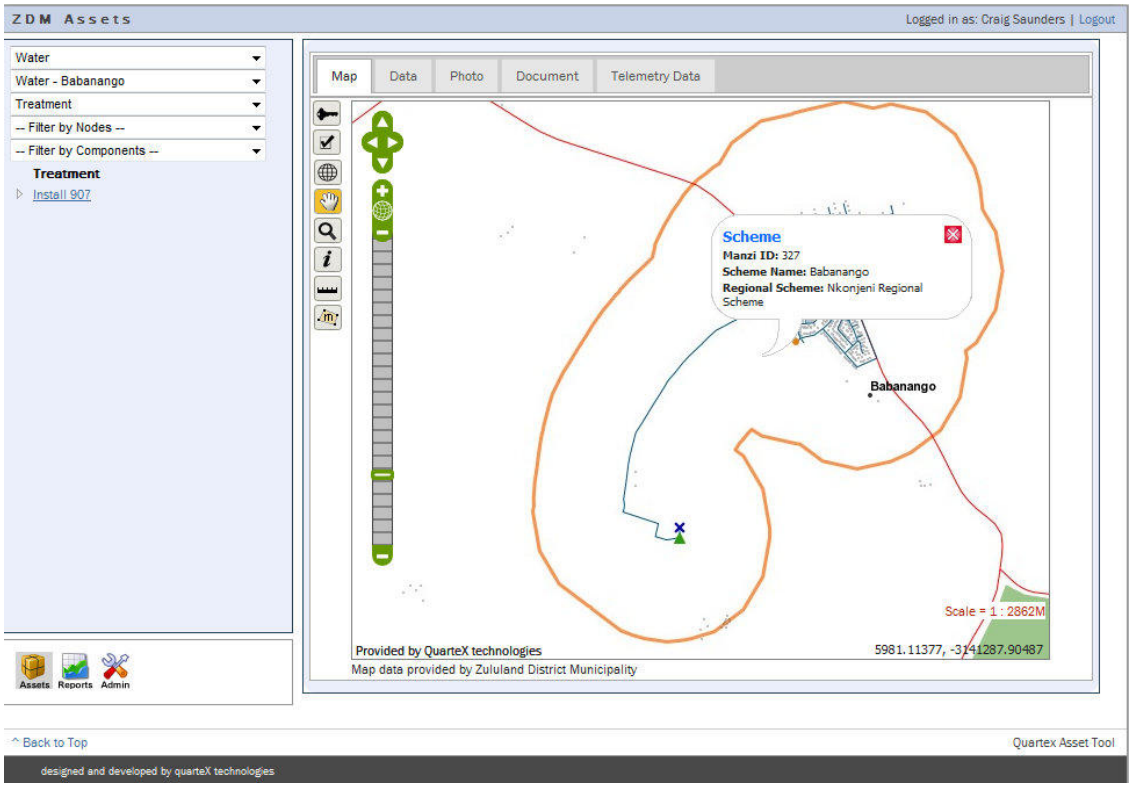


Different asset groups have been identified for water and sanitation infrastructure and these could be either listed as installations, nodes or components. Asset data forms have been developed for each asset group and this is used to capture asset information in the database. The asset data forms provide an overview of the type of information that is available on each asset group. Examples of such asset groups are:

- Water treatment works
- Sewage works
- Pump stations
- Pipelines
- Reservoirs
- Meters
- Valves
- Electrical equipment, etc

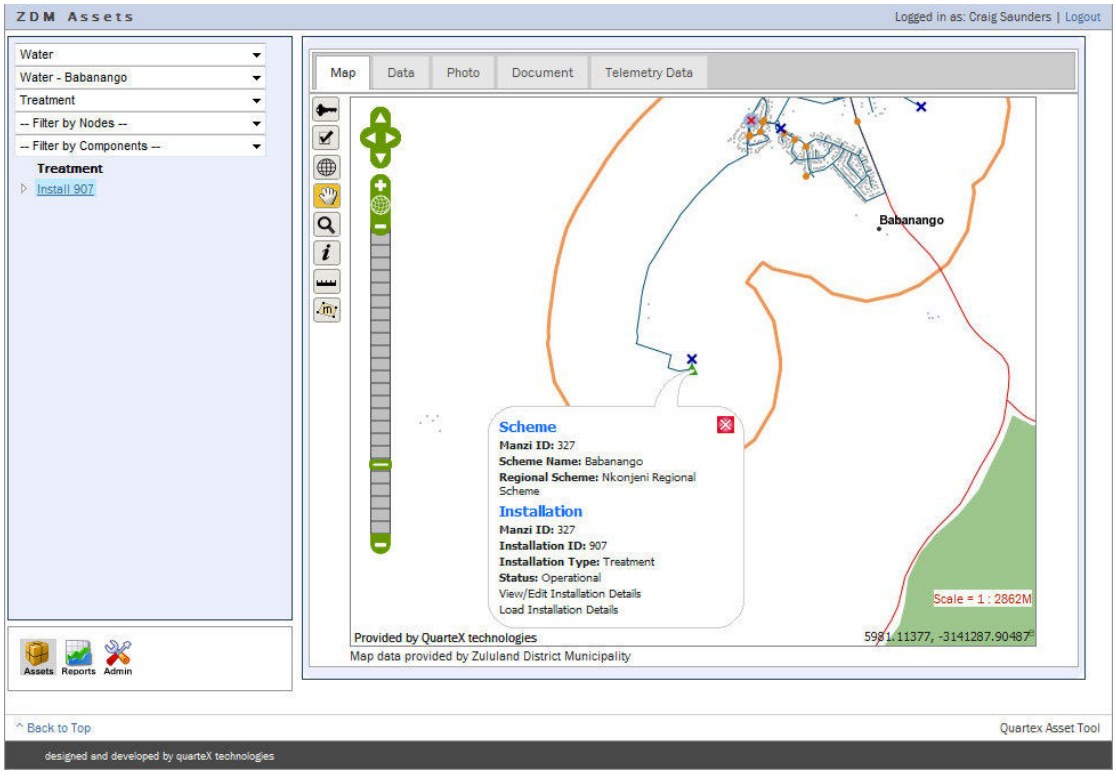
The Nkonjeni Regional scheme is again used as an example to illustrate the data hierarchy that has been used. Inside the Nkonjeni Regional scheme footprint there currently exists a number of schemes, varying from RDP to rudimentary schemes. Each of the schemes are allocated a scheme ID number by the system that is used to identify the scheme in all reporting that is used and to link different assets to the scheme. One of the schemes within this footprint is the Babanango scheme and the information captured at “scheme” level is shown in Figure 5.1 (d) below:

Figure 5.1 (d): Babanango scheme: Map interface showing scheme detail



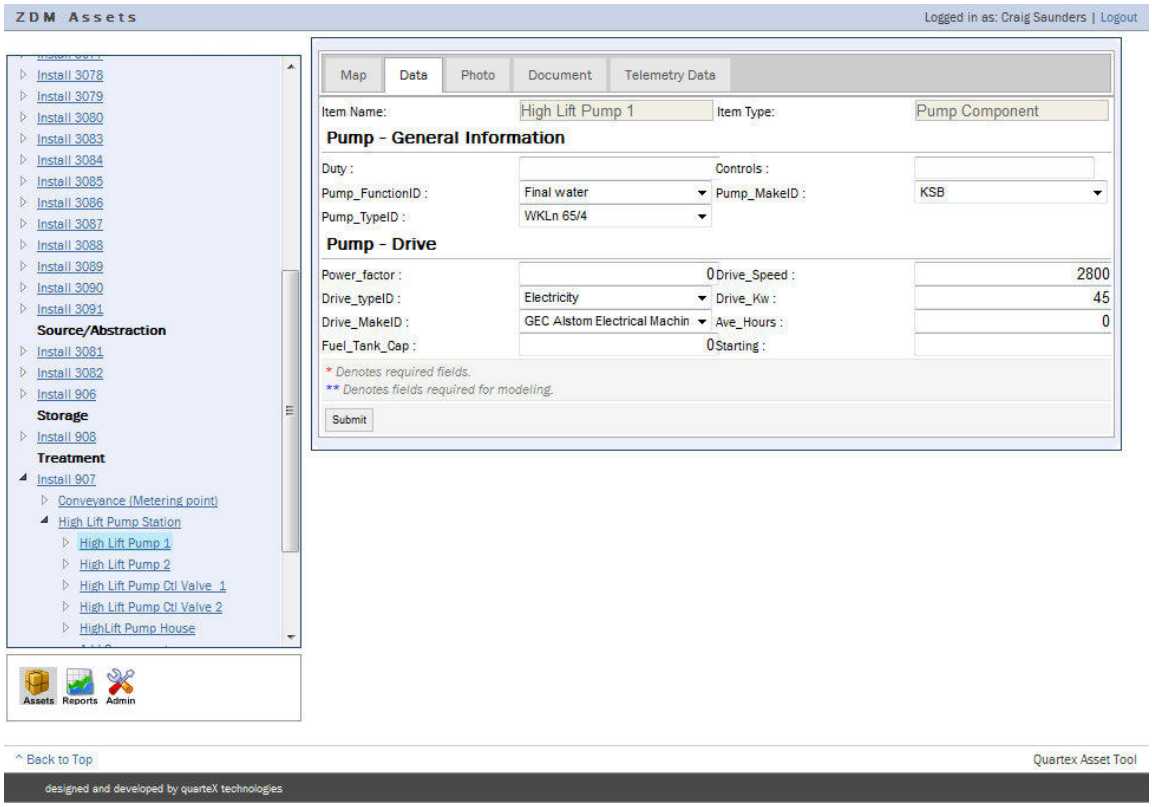
The Babanango water treatment works is one of the installations on this particular scheme and the asset data form captured at "installation" level is shown below in Figure 5.1 (e):

Figure 5.1 (e): Babanango water treatment works: Map interface showing "installation" location



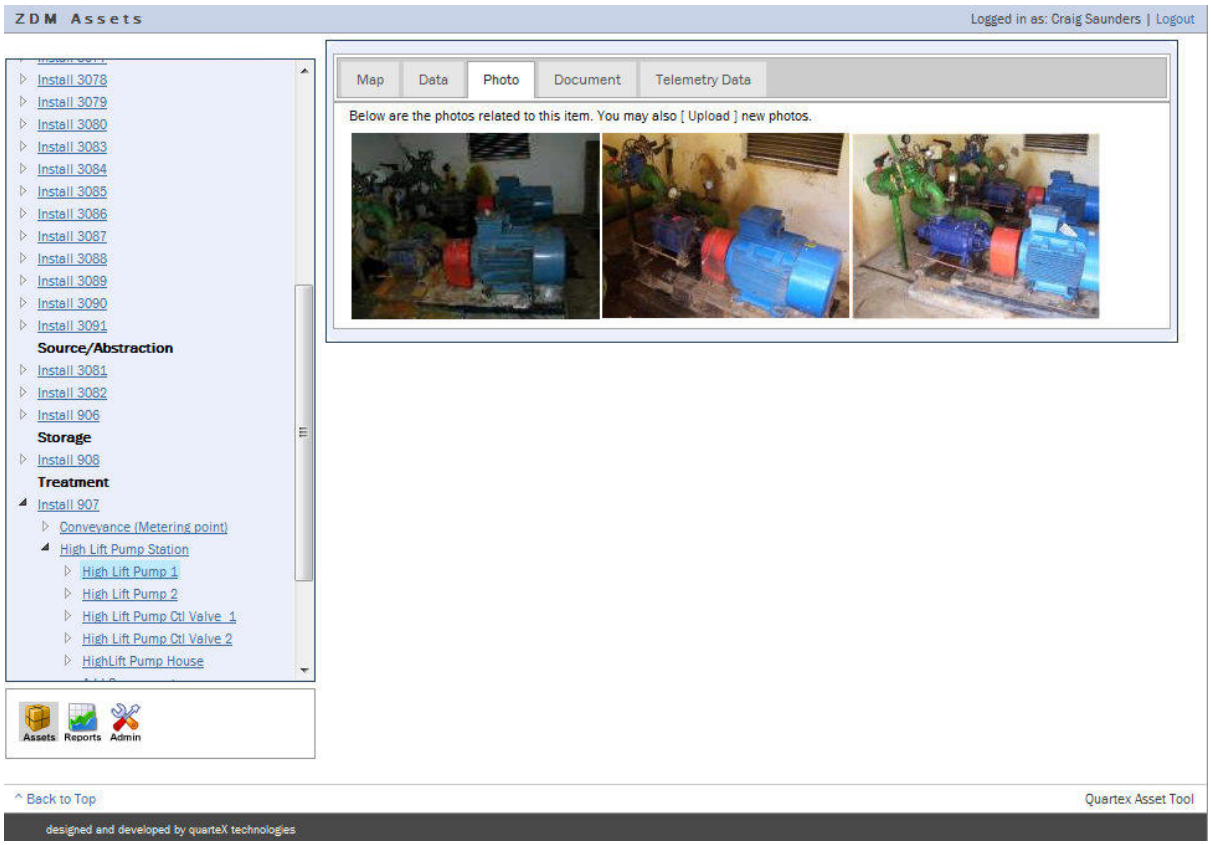
Within the Babanango water treatment works a number of nodes are listed, for example the raw water storage, sedimentation tanks, clarification process, sand filters, etc. The high lift pumping process is used as an example in this case and the asset data form captured at "component" level is shown in Figure 5.1 (f) below:

Figure 5.1 (f): Babanango water treatment works: High lift pumping process: information captured at "component" level – Component details



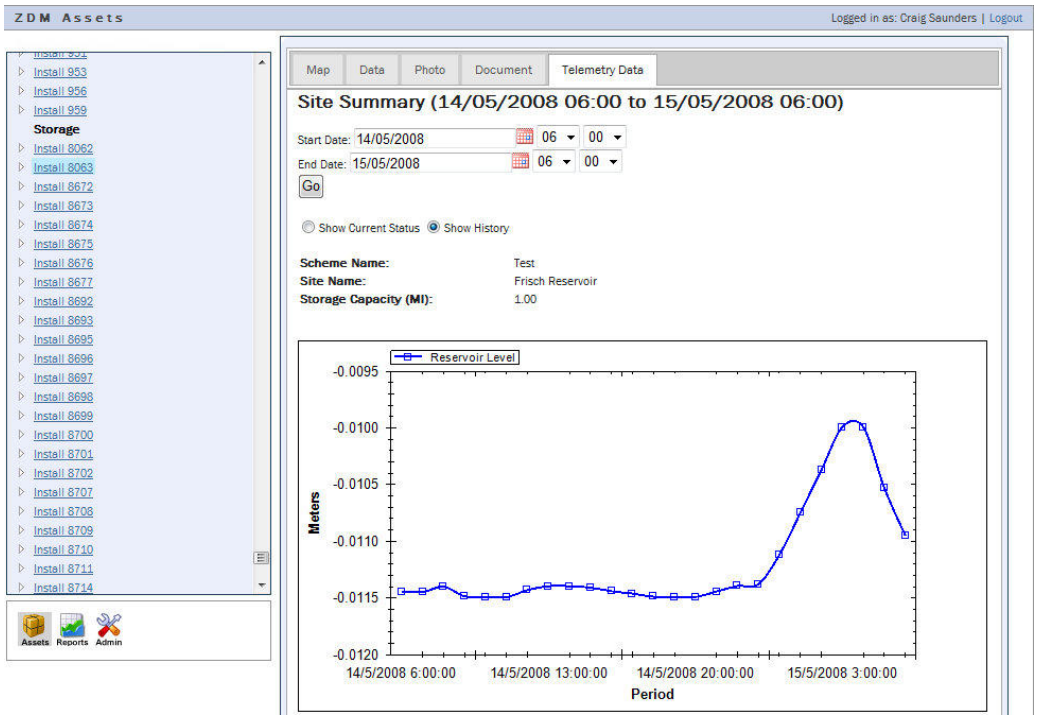
The different nodes within the Babanango water treatment works comprise of a number of components. The clear water pump station is such a node that comprises of various components such as the high lift pumps, electrical equipment, etc. The asset data form captured for the clear water pump station at "component" level is shown in Figure 5.1 (g) below:

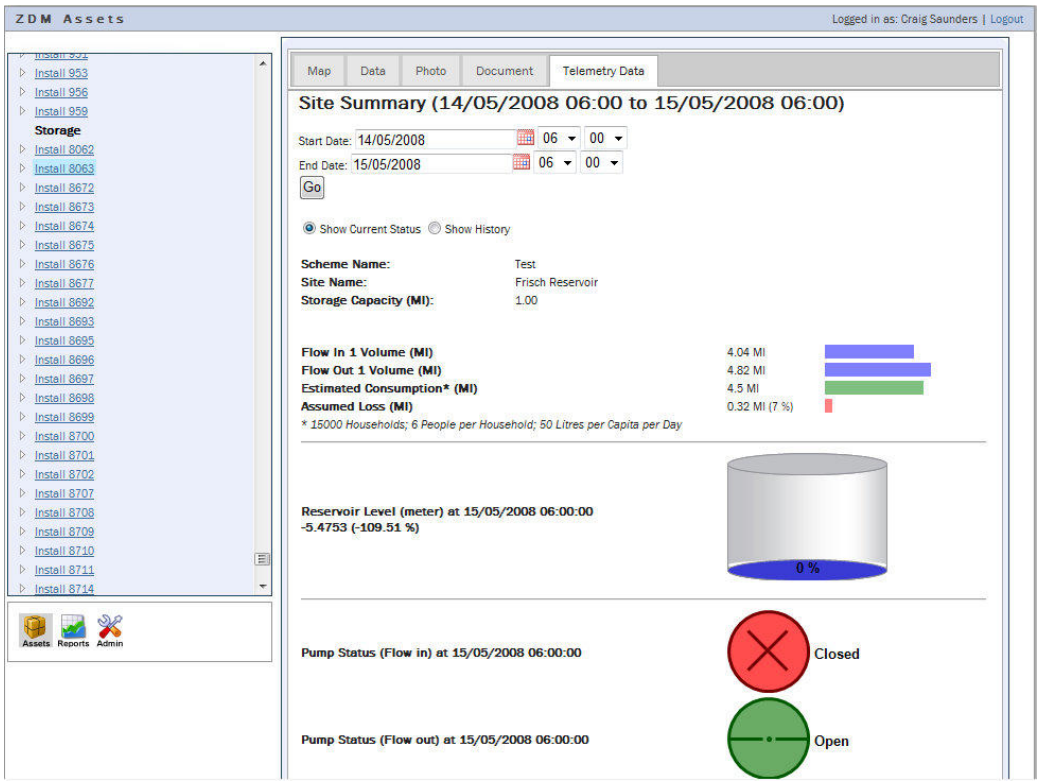
Figure 5.1 (g): Babanango water treatment works: High lift pumping process: information captured at "component" level - Photographs



In the same way documents specific to any level of the scheme map be uploaded to the system.

Telemetry has also been linked to the system and where data logging devices are installed, the outputs are presented, an example of the outputs for the telemetry at the Frischgewaagd Plant is shown in the figure below:

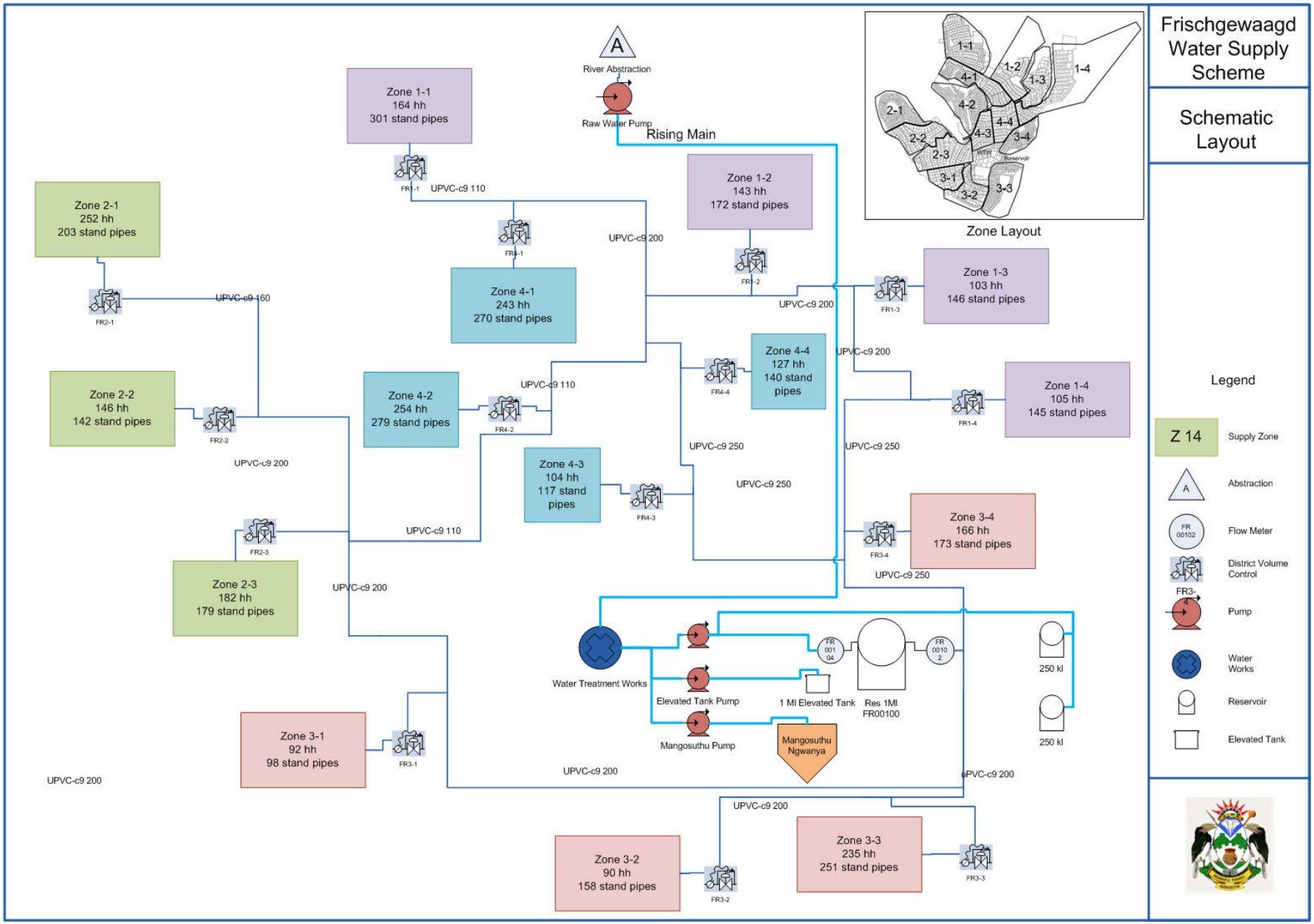




Schematic diagrams are also compiled for each scheme and basically summarises the main installations and nodes that make up the scheme. The diagram also shows how the installations and nodes are connected to make up the scheme and the direction of flow of the water or sewage.

The schematic diagram also forms the basis for the development of a water balance and telemetry installation for the scheme. The Frischgewaagd scheme is used as an example and the schematic diagram is attached herewith in Figure 5.1 (h) below:

Figure 5.1 (h): Schematic layout of Frischgewaagd water scheme



5.2 Asset management assessment

As mentioned above ZDM is well advanced with the development of MANZI, the ZDM asset management system. The system currently comprises mostly asset data and work is being done to develop operational and maintenance procedures for the assets, which will guide the activities for the ongoing upkeep of asset conditions. Assessments have already been done on certain issues related to asset management and further work needs to be done on other issues, as summarised below:

- **Human resources** - The ZDM Section 78 investigation was finalised in 2007 and identified the most appropriate water services provider arrangement for the ongoing O&M of water services infrastructure in the district. Current staff organograms were compiled and compared with the minimum required staff resources needed to perform the O&M duties adequately. Shortages in staff numbers were identified and are being addressed over time within the ZDM financial means. Training of existing staff was also identified as a crucial element to ensure highly efficient personnel and this is being addressed annually as part of the ZDM Skills Development Plan. Certain functions have also been indentified that cannot cost effectively be developed in-house and will rather be contracted in externally.
- **Materials, tools & equipment, transport** – The Section 78 investigation has also identified shortcomings in this regard and has listed vehicles and equipment to be purchased in order to have fully functional O&M teams. The need for additional stores has also been identified throughout the district and these are progressively being addressed with the available funding.
- **Budget** – The Section 78 investigation has identified the funding requirements at present and in the future to adequately operate and maintain existing assets and new assets to be added over time. This information guides the preparation of the annual O&M budget, although available financial resources are not sufficient.
- **Asset information** – The locality information on assets is very good and particularly the water assets are viewed to be more than 80% covered. Sewerage information is still lacking but is being addressed. Asset information that also still needs further work includes as-built information, design reports, operating manuals, safety plans, etc. Assessments were also done on asset conditions to determine a brief overview of the status of assets and start identifying where urgent work needs to be done. Photographs were taken of each asset visited and have been included into the MANZI system.
- **Risk management** – ZDM realises that available resources will never really be sufficient to address all needs at once and therefore work has started on the development of a risk based approach to asset management. This model will consider the risk of failure of an asset, the consequence of such a failure and the probability of a failure occurring. This will all be compared to ensure that resources are applied where really needed most.
- **Reporting** – The ZDM WSP reporting system will feed back valuable information to management regarding O&M activities and asset performance. This information will be used to adjust asset management priorities if needed and also track the efficiency of asset management projects that are being implemented.

5.3 Schemes to be transferred

All schemes and related staff that were identified to be transferred from DWA and Department of Works to ZDM have been concluded. There are other schemes in the district still being operated by National Department of Works, e.g water services at prisons, but no formal or informal request have yet been entered into for the transfer of these schemes.

5.4 Schemes to be rehabilitated

There are currently a number of investigations underway to determine the refurbishment requirements of water services infrastructure in the district. The refurbishment requirements at bulk plants are receiving first priority since it is perceived that the most urgent interventions are required at these assets. Investigations are also being commissioned to determine the condition of urban infrastructure and the refurbishment needs in the towns. Whilst new infrastructure has been rolled out in the rural areas to previously neglected communities, the infrastructure in towns have received very little attention and funding since 1994 and it can be expected that most of the refurbishment requirements will be in these areas. The above mentioned investigations have not yet been fully completed and the results will be included once available.

Assessment of the bulk water and sewage works:

During June 2009 consultants were appointed to assess the Water and Waste Water Works in Zululand District Municipality. The assessments included recommendations and cost estimates to refurbish and/or upgrade these works in the short term and medium to long term. These assessments also recommended emergency interventions.

This Technical report was compiled to secure funding for the emergency interventions, short term refurbishment and medium to long term upgrading.

Emergency interventions are needed where work is needed to attend to fatal problem areas, such as settlements consuming raw untreated water, sewer water spilling directly into rivers and structures that is almost collapsing. Short term refurbishment (not critical work) is needed to refurbish and upgrade the existing works in order to meet the current demands and also to enable the works to function at its design capacity. These short term refurbishments were prioritised using criteria such as cost per capita and current demand versus current capacity.

Medium to long term upgrading (not critical work) is needed to upgrade the existing works in order to meet the future demands. These long term refurbishments were prioritised using criteria such as cost per capita and future demand versus the capacity after short term refurbishment. Some of these works will become redundant in future (As they will be incorporated into larger regional schemes). This was also taken into account.

Table 5.4 (a): The list of Waste Water Treatment works that were assessed

Waste Water Treatment Works		Current Delivery	Regional Area	Local Municipality
		ML/d		
1	Frischgewaagd WWTW	0.08	Sim West	eDumbe
2	Paulpieterburg WWTW	0.30	Sim West	eDumbe
3	Vryheid Town WWTW	9.00	Hlahlindlela	Abaqulusi
4	eMondlo WWTW	2.40	Hlahlindlela	Abaqulusi
5	Nkongolwane WWTW	0.25	Coronation	Abaqulusi
6	Alpha Mine WWTW	0.00	Khambi	Abaqulusi
7	Hlobane WWTW	0.35	Coronation	Abaqulusi
8	Coronation WWTW	1.00	Coronation	Abaqulusi
9	Itshelejuba Hospital WWTW	0.09	Sim Central	uPongola
10	Pongola Town WWTW	2.50	Sim East	uPongola
11	Thulasizwe Hospital WWTW	0.03	Usuthu	Nongoma
12	Holinyoka/Nongoma WWTW	1.80	Usuthu	Nongoma
13	Ceza WWTW	0.14	Usuthu	Nongoma
14	James Nxumalo WWTW	0.08	Nkonjeni	Ulundi
15	Nkonjeni Hospital WWTW	0.20	Nkonjeni	Ulundi
16	St Francis Hospital WWTW	0.06	Nkonjeni	Ulundi
17	Ulundi Town WWTW	2.60	Nkonjeni	Ulundi
18	Enyathi WWTW	0.00	Coronation	Abaqulusi

Table 5.4 (b): The list of Water Treatment works that were assessed

Water Treatment Works		Current Delivery	Regional Area	Local Municipality
		ML/d		
1	Frischgewaagd WTW	2	Sim West	eDumbe
2	eDumbe WTW (Paulpietersburg)	3	Sim West	eDumbe
3	Ophuzane WTW	0.5	Sim West	eDumbe
4	Tholakele WTW	0.5	Sim West	eDumbe
5	Klipfontein WTW	10	Hlahlindlela	Abaqulusi
6	Bloemveld WTW	5	Hlahlindlela	Abaqulusi
7	Mondlo WTW	9	Hlahlindlela	Abaqulusi
8	Mvuzini WTW	0.5	Hlahlindlela	Abaqulusi
9	Purim WTW	0.24	Hlahlindlela	Abaqulusi
10	Hlobane WTW	2	Coronation	Abaqulusi
11	Louwsburg WTW	0.72	Coronation	Abaqulusi

Table 5.4 (b): The list of Water Treatment works that were assessed (continued)

Water Treatment Works		Current Delivery ML/d	Regional Area	Local Municipality
12	Coronation WTW	0.4	Coronation	Abaqulusi
13	Khambi WTW	0.2	Khambi	Abaqulusi
14	Mountain View WTW	0.05	Khambi	Abaqulusi
15	Belgrade WTW	1.1	Sim Central	uPongola
16	Msibi WTW	0.03	Sim Central	uPongola
17	Khiphunyawo WTW	0.37	Sim Central	uPongola
18	Nkosentsha WTW	0.13	Sim Central	uPongola
19	Spekboom WTW	1.8	Sim East	uPongola
20	Pongola WTW	6.3	Sim East	uPongola
21	Osingisingini WTW	0.04	Usuthu	Nongoma
22	Thulasizwe Hospital WTW	0.2	Usuthu	Nongoma
23	Vuna WTW	4.2	Usuthu	Nongoma
24	Ceza WTW	0.4	Usuthu	Nongoma
25	Khangela Palace WTW	0.01	Usuthu	Nongoma
26	Enyokeni Palace WTW	0.02	Usuthu	Nongoma
27	Ulundi WTW	18	Nkonjeni	Ulundi
28	Mpungamhlope WTW	0.63	Nkonjeni	Ulundi
29	Babanango WTW	0.33	Nkonjeni	Ulundi
30	Enyathi WTW		Coronation	Abaqulusi
31	Mandlakazi WTW	1.7	Mandlakazi	Nongoma
32	Sidinsi WTW		Mandlakazi	Nongoma
33	Kombusi WTW		Mandlakazi	Nongoma
34	Embile WTW		Usuthu	Nongoma
35	Masokaneni WTW		Nkonjeni	Ulundi
36	Nkonjeni Hospital WTW		Nkonjeni	Ulundi

The results of the assessments are shown in Tables 5.4 (c) & (d) below:

Table 5.4 (c): Assessment of Water Treatment Works

	Water Treatment Works	Current Delivery	Cost Estimate Emergency Work	Cost Estimate Short Term	Cost Estimate Long Term (Excludes short term)
		ML/d	ex VAT and Prof fees	ex VAT and Prof fees	ex VAT and Prof fees
1	Frischgewaagd WTW	2	R -	R 1 040 000	R 45 000 000
2	eDumbe WTW (Paulpietersburg)	3	R -	R 2 490 000	R 20 000 000
3	Ophuzane WTW	0.5	R -	R 540 000	R -
4	Tholakele WTW	0.5	R -	R -	R -
5	Klipfontein WTW	10	R -	R 8 870 000	R 4 415 000
6	Bloemveld WTW	5	R -	R 3 640 000	R 5 200 000
7	Mondlo WTW	9	R 480 000	R 180 000	R 2 400 000
8	Mvuzini WTW	0.5	R -	R -	R -
9	Purim WTW	0.24	R -	R -	R 250 000
10	Hlobane WTW	2	R 450 000	R 1 590 000	R -
11	Louwsburg WTW	0.72	R 320 000	R 2 500 000	R -
12	Coronation WTW	0.4	R 850 000	R 1 140 000	R 22 000 000
13	Khambi WTW	0.2	R -	R -	R 150 000
14	Mountain View WTW	0.05	R -	R -	R 265 000
15	Belgrade WTW	1.1	R 226 000	R 95 300	R 12 500 000
16	Msibi WTW	0.03	R 74 000	R 2 055 000	
17	Khiphunyawo WTW	0.37	R 18 000	R 4 140 000	
18	Nkosentsha WTW	0.13	R 77 000	R 1 680 000	
19	Spekboom WTW	1.8	R 334 500	R 1 607 200	
20	Pongola WTW	6.3	R 215 000	R 110 200	R 20 000 000
21	Osingisingini WTW	0.04	R 14 000	R 672 000	
22	Thulasizwe Hospital WTW	0.2	R 16 100	R 42 000	R 800 000
23	Vuna WTW	4.2		R 323 500	
24	Ceza WTW	0.4	R 2 000	R 2 030 000	
25	Khangela Palace WTW	0.01	R 800	R 1 335 000	
26	Enyokeni Palace WTW	0.02	R 36 700	R 28 000	
27	Ulundi WTW	18		R 530 000	
28	Mpungamhlope WTW	0.63	R 17 600	R 35 000	R 20 000 000
29	Babanango WTW	0.33	R 3 400	R 2 335 000	R -
30	Enyathi WTW	No assessments scheduled			
31	Mandlakazi WTW	Assessment outstanding			
32	Sidinsi WTW	Assessment outstanding			
33	Kombusi WTW	Assessment outstanding			
34	Embile WTW	No assessments scheduled			
35	Masokaneni WTW	No assessments scheduled			
36	Nkonjeni Hospital WTW	No assessments scheduled			
37	Usuthu WTW	0.00			R 100 000 000
			R 3 135 100	**R 39 008 200**	**R 252 980 000**

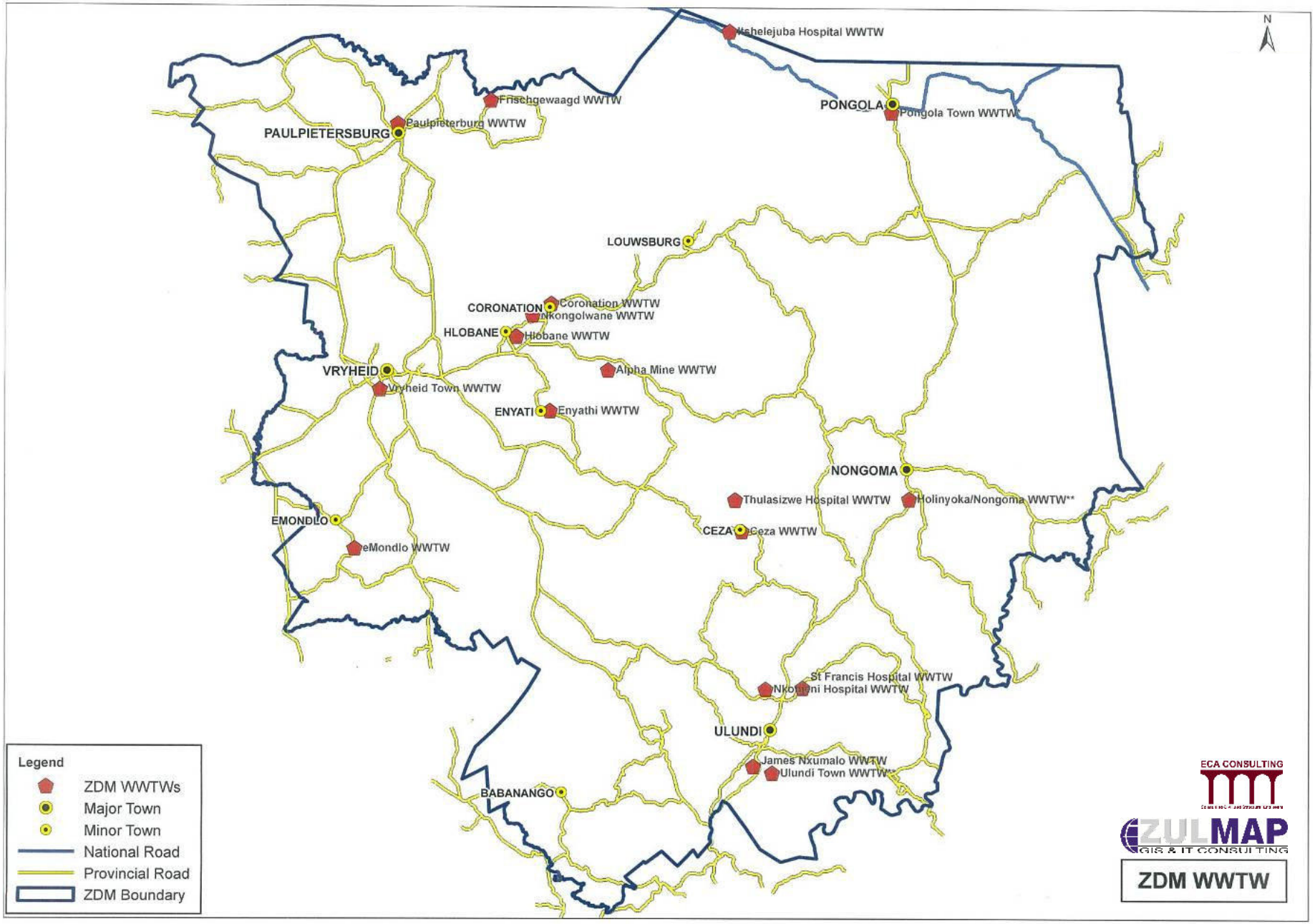
Table 5.4 (d): Assessment of Waste Water Treatment Works

Waste Water Treatment Works		Current Delivery	Cost Estimate Emergency Work	Cost Estimate Short Term	Cost Estimate Long Term (Excludes short term)
		ML/d	ex VAT and Prof fees	ex VAT and Prof fees	ex VAT and Prof fees
1	Frischgewaagd WWTW	0.08	R 0	R 300 000	R 40 000 000
2	Paulpieterburg WWTW	0.30	R 550 000	R 1 800 000	R 0
3	Vryheid Town WWTW	9.00	R 0	R 0	R 0
4	eMondlo WWTW	2.40	R 725 000	R 3 630 000	R 5 500 000
5	Nkongolwane WWTW	0.25	R 0	R 0	R 990 000
6	Alpha Mine WWTW	0.00	R 0	R 300 000	R 0
7	Hlobane WWTW	0.35	R 900 000	R 3 150 000	R 450 000
8	Coronation WWTW	1.00	R 850 000	R 3 980 000	R 6 000 000
9	Itshelejuba Hospital WWTW	0.09		R 70 000	R 800 000
10	Pongola Town WWTW*	2.50	R 13 000	R 363 500	R 1 390 000
11	Thulasizwe Hospital WWTW	0.03		R 220 000	R 50 000
12	Holinyoka/Nongoma WWTW**	1.80		R 1 719 753	R 4 310 000
13	Ceza WWTW	0.14		R 660 000	R 2 000 000
14	James Nxumalo WWTW	0.08		R 270 000	R 890 000
15	Nkonjeni Hospital WWTW	0.20		R 70 000	R 1 770 000
16	St Francis Hospital WWTW	0.06		R 75 000	R 840 000
17	Ulundi Town WWTW**	2.70		R 600 000	R 2 900 000
18	Enyathi WWTW	0.00	No assessments Scheduled		
	Total		**R 3 038 000**	**R 17 208 253**	**R 67 890 000**

The above assessments are currently in the process of being reviewed and updated for further interventions.

Figure 5.4 (a): Locality map of the Water Treatment Works

Figure 5.4 (b): Locality map of the Sewage Works



5.5 Blue Drop / Green Drop Assessments

The Blue Drop Report Card and Scoring Criteria

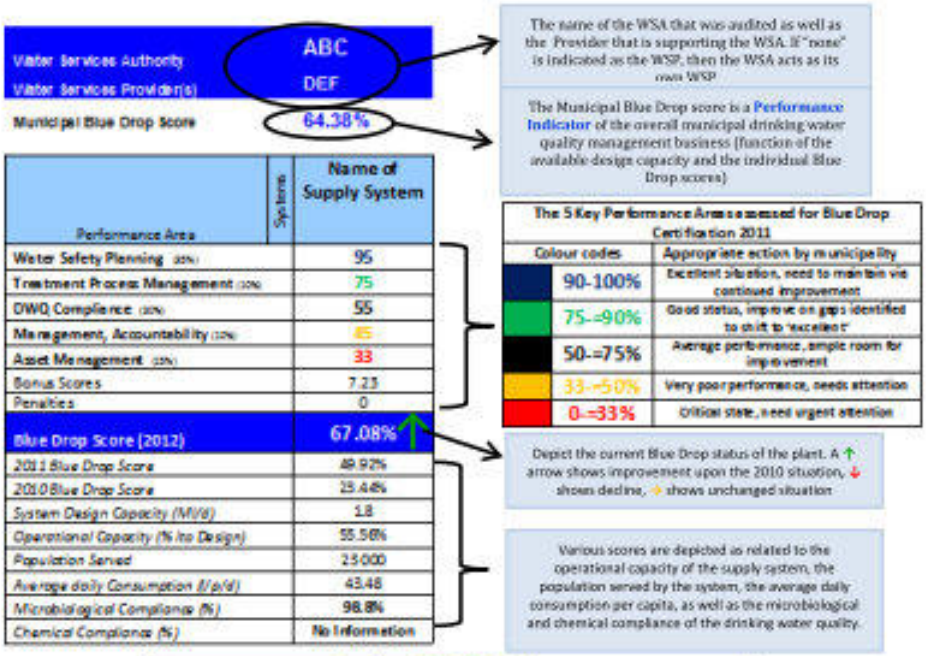
Assessments are conducted by a panel consisting of a qualified drinking water quality professional as Lead Inspector, 2-4 Inspectors (Assessors) and a Learner Assessor who also coordinates the logistical arrangements of the assessments.

The team selection is done based on the outcomes of a Blue Drop Examination which tests the assessor's knowledge and competence in the subject field. Virtual assessments were done in cases where municipalities uploaded their Portfolio of Evidence (or parts of) onto the Blue Drop System. The scorecards outlines the key requirements of the Blue and Green Drop Assessments and indicate the Portfolio of Evidence that was required by each municipality to calculate a Blue and Green Drop score per water supply system.

The latest Blue and Green Drop Assessment outcomes can be requested from the Planning Department of ZDM.

How to read the Report Card

The following is an example of a typical municipal Blue Drop report card. Results are provided in colour-coded format – each colour has a specific meaning and performance reference.



Quality of Drinking Water	
Colour Drop	**Indication of Drop**
	Blue Drop Certified, water safe to drink; complied excellently with national standards throughout the reporting period; Must have scored 95% on adherence to Blue Drop Requirements; Water must comply excellently with SABS 241; Water safe to drink.
	Water complied excellently with standard; safe to drink Micro > 97% Chemical > 95%
	Water safe to drink but some chemical parameter compliance requires improvement Micro > 97% Chemical < 95% (or no Information)
	Water generally safe to drink but with recorded some microbiological failures Micro < 97% Chemical > 95%
	Water did not comply according to expected standard targets Micro > 90% < 95% Chemical > 90% < 95%
	Compliance levels too low; there were extended periods when the water did not comply with standard / or no monitoring to confirm actual quality of tap water Micro < 90% Chemical < 90%

The Green Drop Report Card

How to Read the Report Card

The following is an example of a typical municipal report card that appears in the Green Drop Report 2013.
Results are provided in colour coded format – each colour has a specific meaning and performance reference.

Water Services Authority	**ABC Local Municipality**
Water Services Provider(s)	**ABC WSP**

2013 Municipal Green Drop Score	**81.63%**
2011 Municipal Green Drop Score	63.80%
2009 Municipal Green Drop Score	75.00%

The Municipal Green Drop score is a **Performance Indicator** of the overall municipal wastewater business (function of the available design capacity and the individual Green Drop scores).
Arrows: Depict the current Green Drop status of the plant. A ↑ arrow shows improvement upon the 2009situation, ↓ shows digress, → shows unchanged situation

Key Performance Area	Weight	System X
Process Control & Maintenance Skills	10%	67
Monitoring Programme	15%	95
Submission of Results	5%	100
Effluent Quality Compliance	30%	16
Risk Management	15%	90
Local Regulation	5%	100
Treatment Capacity	5%	100
Asset Management	15%	94
Bonus Scores		8.48
Penalties		1.90
Green Drop Score (2013)		**74.88%**
2011 Green Drop Score		47.00%
2009 Green Drop Score		66.00%
System Design Capacity	Ml/d	2.3
Capacity Utilisation (% ADWF ito Design Capacity)		112.0%
Resource Discharged into		Pienaars River (sensitive, special standard apply)
Microbiological Compliance	%	12.95%
Chemical Compliance	%	24.35%
Physical Compliance	%	20.69%
Overall Compliance	%	20.90%
Wastewater Risk Rating (2012)		76.50%
Wastewater Risk Rating (2013)		76.47%

Note: volumetric capacity refers to Average Dry Weather Flow

Colour codes	Appropriate action by institution
90-100%	Excellent situation, need to maintain via continued improvement
80-<90%	Good status, improve where gaps identified to shift to 'excellent'
50-<80%	Fair performance, ample room for improvement
31-<50%	Very poor performance, need targeted intervention towards gradual sustainable improvement
0-<31%	Critical state, need urgent intervention for all aspects of the wastewater services business

≥90% = Green Drop Certification
<30% = Purple Drop Status

Plant is receiving 12% more wastewater compared to its original design capacity (ADWF)

Effluent quality compliance to legislative standards carries a high (30%) weight in the GDC score

The CRR% Deviation (CRR/ CRRmax) score is specific to the wastewater "treatment" function of the service. This score indicates the actual risk as a % of the maximum risk that the plant potentially can reach. An orange and redblock indicate that the plant is in high- or critical risk that warrants urgent attention. A higher value reflects a high risk state (undesirable). A lower value reflects a lower risk state.

CRR% Deviation	
	90 – 100% Critical risk WWTP
	70 - <90% High Risk WWTP
	50-<70% Medium risk WWTP
	<50% Low Risk WWTP

5.6 New infrastructure to be built

Water infrastructure:

During 2004 the ZDM started a comprehensive water master planning exercise to determine the most appropriate methods of providing previously neglected communities with water services. In all cases the main drivers were to obtain the technical solution that will not necessarily be the lowest in terms of capital requirements to implement, but rather that will provide a sustainable service throughout the year (sustainable water source) at the lowest possible water tariff (R/kl). The first step was to identify sustainable water sources in the district that could be used to provide water supply even during extreme drought situations and then to determine the most cost efficient way of supplying communities from these sources. The planning methodology that was used can be summarised as follows:

- Identify logical supply footprints
- Identify all possible options for supplying water to supply footprints
- Determine the capital and operational costs associated with each option
- Evaluate each option
- Decide on most appropriate solution

From the above planning process the entire district was covered with 10 back-to-back Regional Schemes, which are listed below and indicated on Figure 5.5 (a) attached herewith:

- Nkonjeni Regional Scheme
- Usuthu Regional Scheme
- Mandlakazi Regional Scheme
- Mkhuze Regional Scheme
- Simdlangentsha East Regional Scheme
- Simdlangentsha West Regional Scheme
- Simdlangentsha Central Regional Scheme
- Coronation Regional Scheme
- Khambi Regional Scheme
- Hlahlindlela Regional Scheme

Also indicated herewith on Figure 5.5 (b) is the planned future bulk infrastructure that was identified from the above planning process.

Sanitation infrastructure:

Further planning work is still required in the urban areas to confirm the suitability of the bulk infrastructure, especially with regards to increased pressures on this infrastructure due to an increasing urbanisation trend that has been occurring and also to allow for future growth in population.

Sanitation infrastructure being provided in rural areas (previously unserved communities) is limited to household VIP toilets. The units are being implemented as per sanitation prioritisation model.

Pre-cast Manufacturing Plants

As part of the Rural Sanitation Programme rollout, a Local Economic Development initiative was envisaged by ZDM, to establish a local manufacturing plant producing the pre-cast material for the rural sanitation units. Two locations were initially proposed for manufacturing plants, namely Ulundi and Vryheid.

The manufacturing plant in Ulundi was erected and established in 2008 via the Rural Sanitation Project funding, with a second plant completed in Vryheid during 2013. At present it is managed by Conloo, a division of Conrite Walls. The objective is that the manufacturing plant will be handed over to local business partners, and in doing so promote local economic development.

Estimated costs:

Table 5.6 (a) and (b) below summarises the estimated costs to provide sufficient water and sanitation services infrastructure to all households in future:

Table 5.6 (a): Cost of infrastructure to be built

WATER	Capital requirements	2016/2017	2017/2018	>2018
Regional bulk	R 1 923 123 833	R 380 813 147	R 351 266 350	R 1 191 044 336
Secondary bulk	R 1 054 030 068	R 48 562 125	R 31 485 265	R 973 982 678
Reticulation	R 135 680 556	R 10 548 752	R 14 254 789	R 110 877 015
Total capital (new)	**R 3 112 834 457**	**R 439 924 024**	**R 397 006 404**	**R 2 275 904 029**
Regional bulk (WTW)	R 295 123 300	TBA	TBA	TBA
Secondary bulk	TBA	TBA	TBA	TBA
Reticulation	TBA	TBA	TBA	TBA
Total capital (refurbishment)	TBA	TBA	TBA	TBA
Total capital	**R 3 407 957 757**	**R 439 924 024**	**R 397 006 404**	**R 2 275 904 029**

Table 5.6 (b): Cost of infrastructure to be built

SANITATION	Capital requirements	2015/2016	2016/2017	2017/2018	>2018
Bulk infrastructure	R -	R -	R -	R -	R -
Reticulation	R -	R -	R -	R -	R -
VIP toilets	R 310 710 000	56 255 250	51 906 375	TBA	TBA
Total capital (new)	**R 310 710 000**	**R 56 255 250**	**R 51 906 375**	**R -**	**R -**
Bulk infrastructure (WWTW)	88 136 253	TBA	TBA	TBA	TBA
Reticulation	TBA	TBA	TBA	TBA	TBA
VIP toilets (Replacement Prgrm)	408 880 000	-	5 763 750	TBA	TBA
Total capital (refurbishment)	**R 497 016 253**	**R -**	**R 5 763 750**	**R -**	**R -**
Total capital	**R 719 590 000**	**R 56 255 250**	**R 57 670 125**	**TBA**	**TBA**

Funding sources and budget allocations:

Table 5.6 (c) and (d) below summarises the funding sources, implementation programmes and budget allocations for each programme:

Table 5.6 (c): Sources of capital income: water

WATER	Expected Funding	2016/2017	2017/2018	>2018
MIG	R 346 042 500	R 173 021 250	R 173 021 250	TBA
DWA (RBIG)	R 108 000 000	R 108 000 000	TBA	TBA
Housing	R -	R -	R -	R -
Other grant funding (MWIG)	R -	TBA	TBA	TBA
Loans	R -	R -	R -	R -
TOTAL	**R 454 042 500**	**R 281 021 250**	**R 173 021 250**	**R -**
Capital requirements	R 3 407 957 757			
Shortfall	**R -2 953 915 257**			

Table 5.6 (d): Sources of capital income: sanitation

SANITATION	Expected Funding	2016/2017	2017/2018	>2018
MIG	R 115 347 500	57 673 750	57 673 750	TBA
DWA	R -	R -	R -	R -
Housing	R 9 300 000	R 5 000 000	R 4 300 000	TBA
Other grant funding	R -	R -	R -	R -
Loans	R -	R -	R -	R -
TOTAL	**R 124 647 500**	**R 62 673 750**	**R 61 973 750**	**R -**
Capital requirements	R 719 590 000			
Shortfall	**R -594 942 500**			

Implementation rollouts:

Figures 5.6 (a) to (f) below provide an overview on each of the implementation programmes. Detailed maps and project rollout lists can also be reviewed in Section 10.

Figure 5.6 (a): Map of the 10 back-to-back Regional Water Schemes

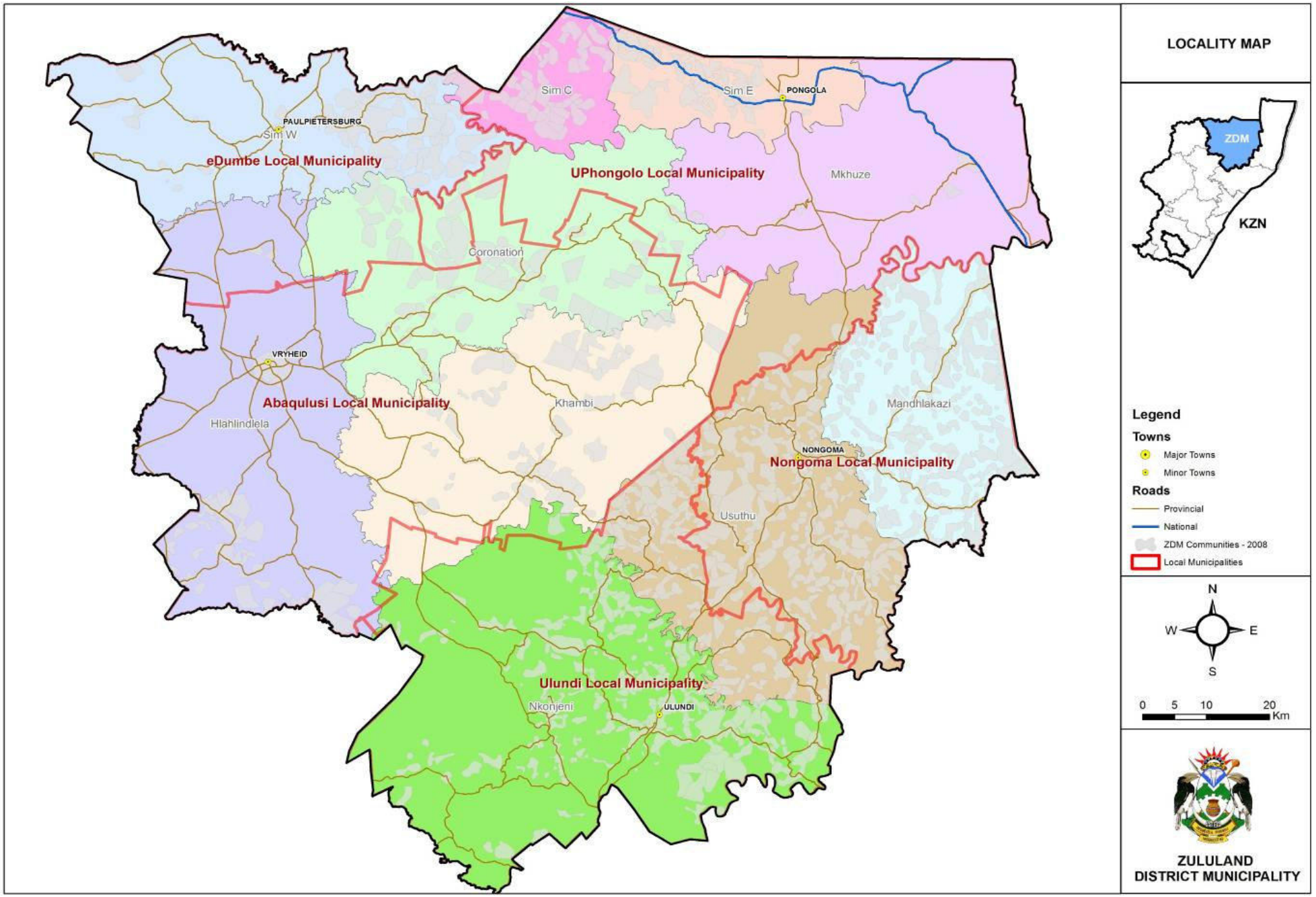


Figure 5.6 (b): Planned future Bulk Infrastructure

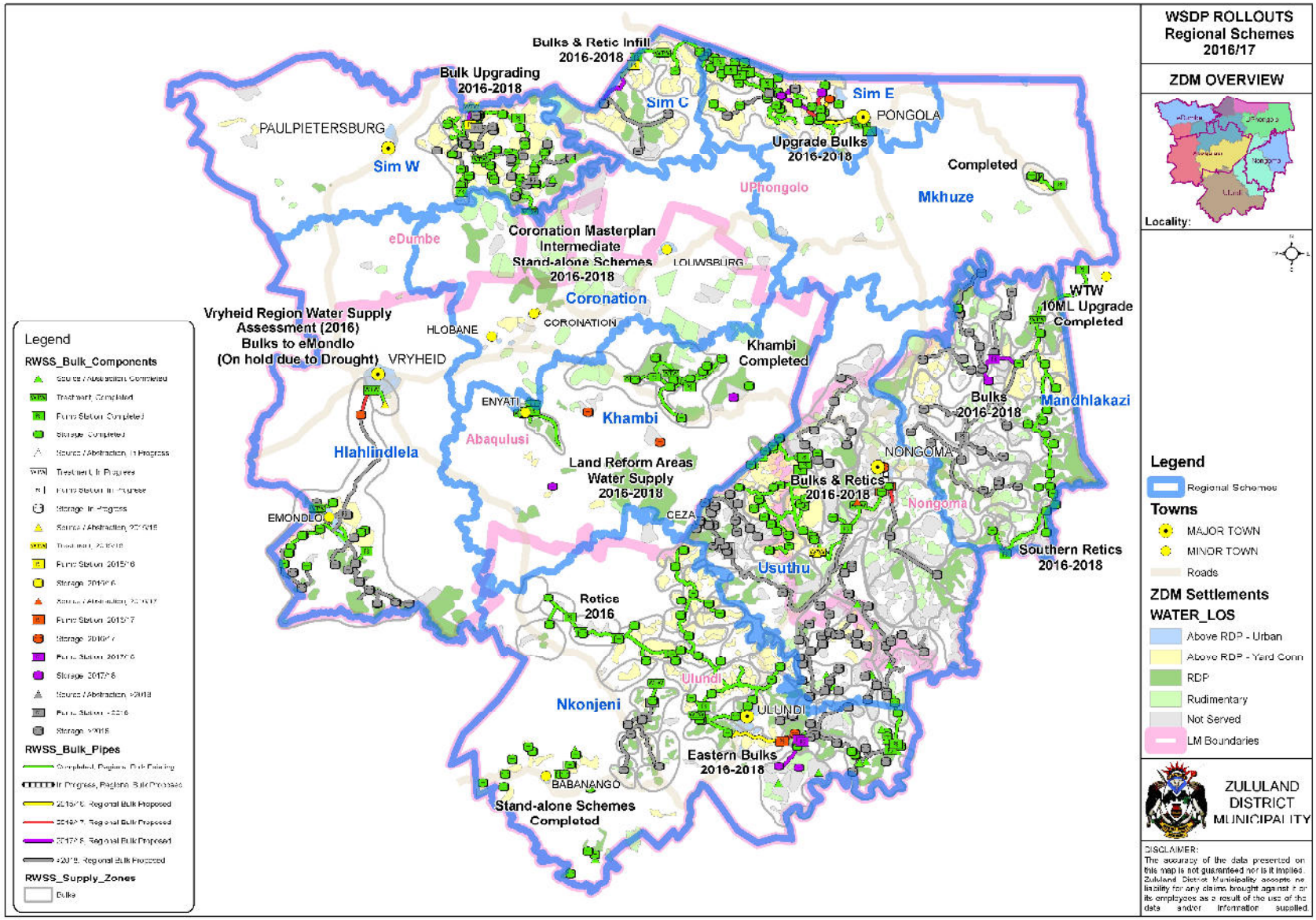


Figure 5.6 (c): Planned future Stand-Alone Schemes to be implemented

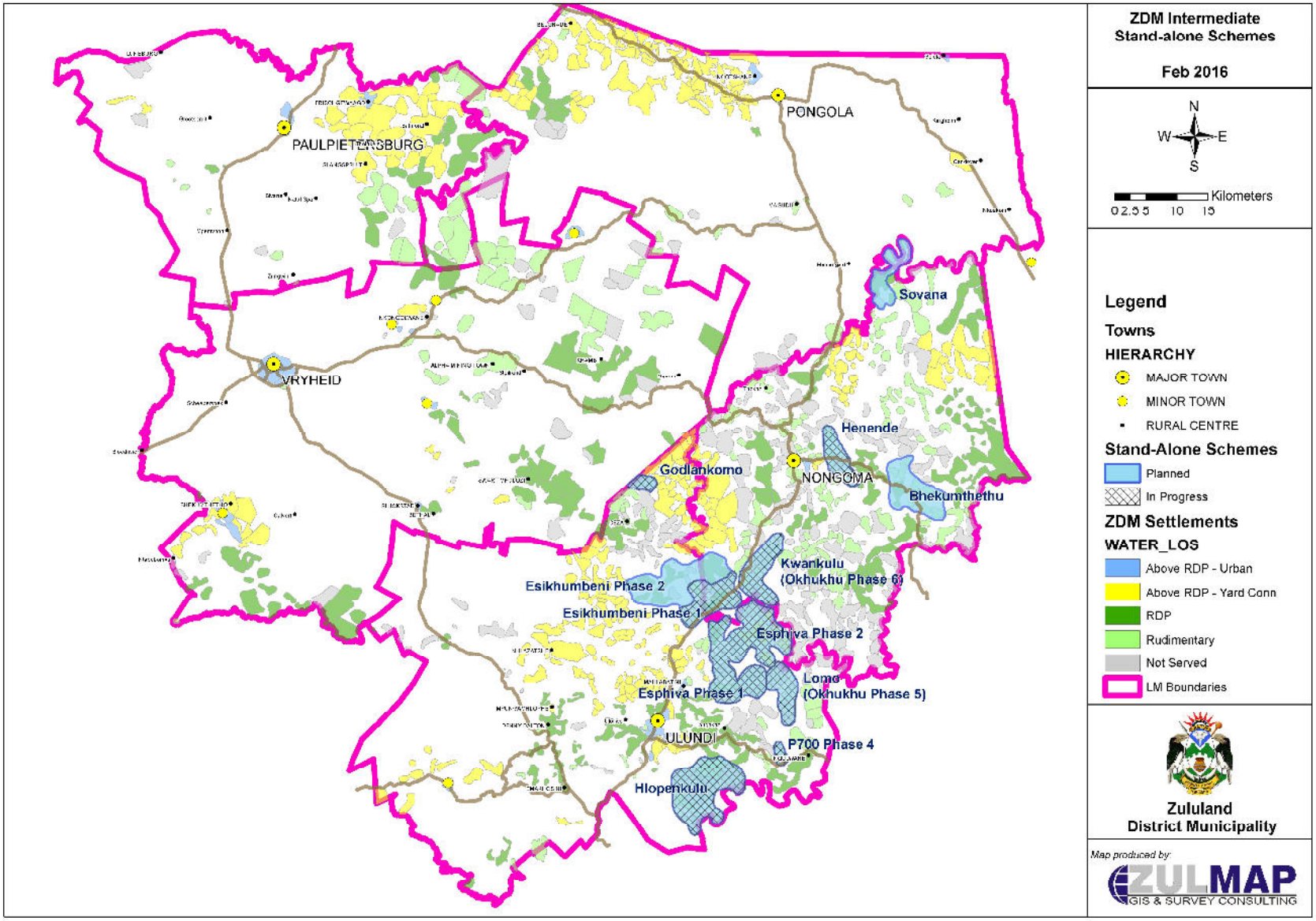


Figure 5.6 (d): Planned rudimentary infrastructure rollouts.

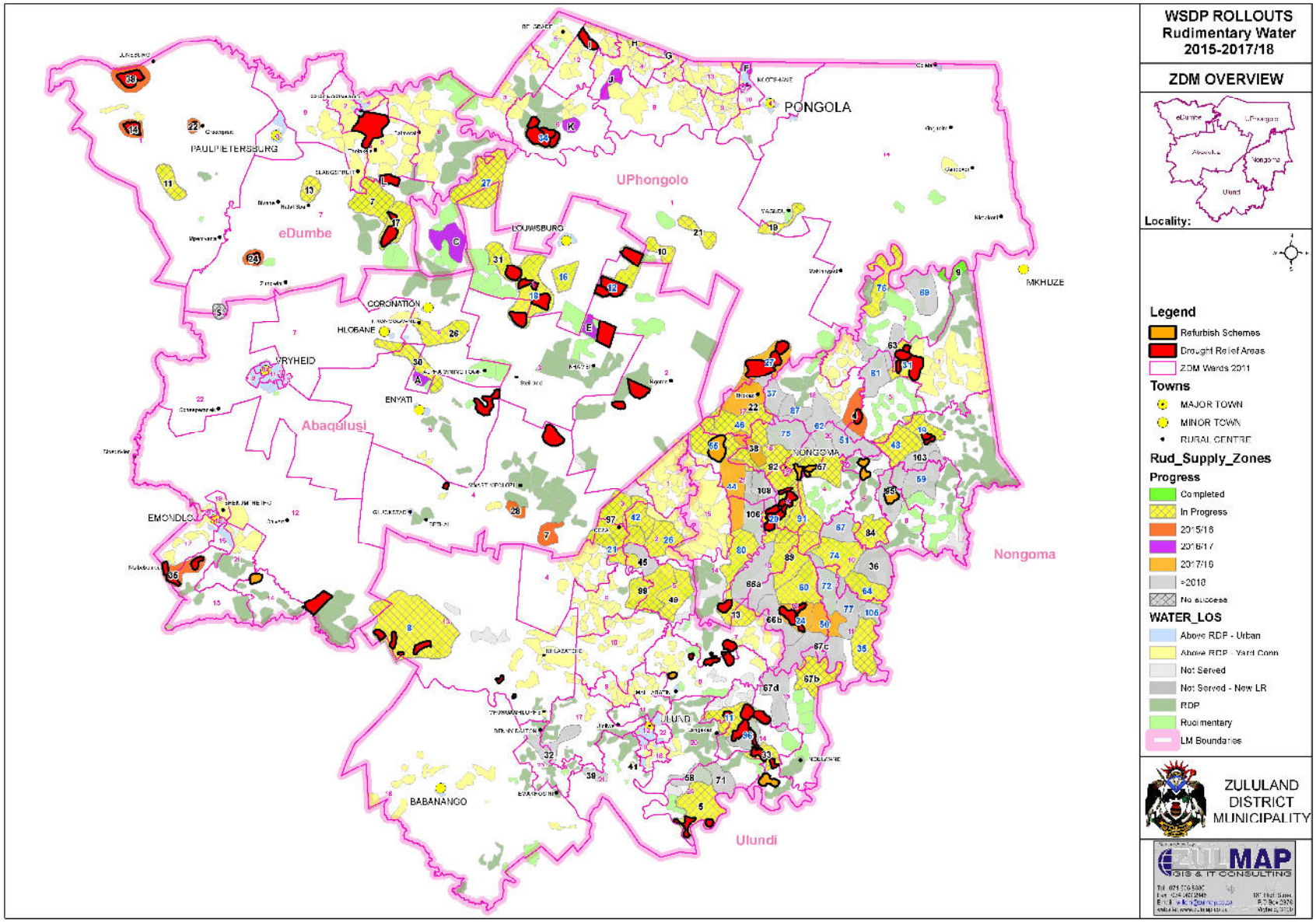


Figure 5.6 (e): Planned rural sanitation infrastructure rollouts.