WSP-9

Eldoret WSP (ELDOWAS)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (ELDOWAS)

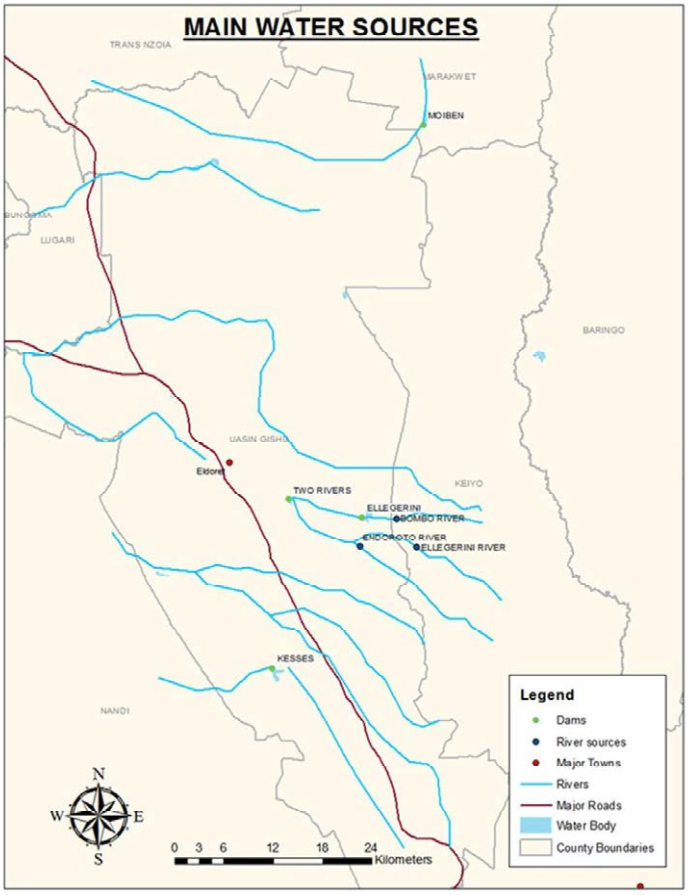
No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	Refer to Table 1.
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Business Plan 2022-2027】 【Strategic Plan 2022-2027】
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. • Kimumu Sanitation Project: Discussions with Belgian Government are at preliminary stage • Sewer Supply System: KPWF put on hold • DMA Project: AOD • 45 km Sewer Network Project, ongoing by Central Rift Valley Water Works Development Agency: AFDB • Kipkaren Water Project (24,000 m^3) ongoing Central Rift Valley Water Works Development Agency: AFDB
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】
7	What is the reason for the inactive connections?	■ No payment ■ No water due to technical problem such as no pressure, blockages and so on ■ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Public sensitization meetings • Water clinics • Radio shows • Road shows

No.	Questions	Answers
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	62,230 m^3/day (From the Water Master Plan Medium Variant)
10	Kindly provide the details for the water demand projection with calculation method and excel file.	【Water Resource Report June 2017】
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	■ Enough to develop the future demand (Moiben Dam) ■ Enough for current demand (Ellegrini Dam) ■ Not enough (Kesses Dam) ■ Need additional water sources (Two Rivers Dam)
	2) Raw Water Quality	□ Meet the standard for drinking purpose ■ Meeting the standard but deteriorating
	3) Intake Facility Intake Volume Facility Condition	 ■ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand ■ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	4) Raw Water Transmission System Transmission Volume Facility Condition	 ■ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand ■ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	5) Water Treatment Plant Treatment Volume Facility Condition	 ■ Sufficient for future water demand (Has a design capacity of over 28,000 m^3/day currently operating at 22,500 m^3/day) □ Sufficient for current demand □ Not sufficient for current demand ■ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	□ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure ■ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	■ Using the saddle clamp with cock □ Using the saddle clam □ Using the tee
	8) Water Meter	■ Using the piston type (Old connection) ■ Using propeller type (New connection) Reason of selecting above: The company has adopted use of velocity meters since they are more reliable and don't get blocked
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe ■ Poor material use ■ High pressure ■ Meter inaccuracy ■ Illegal connection ■ Poor workmanship □ Others

No.	Questions	Answers
	10) Billing System	
	How do you read the water meter?	■ By manual ■ By smart Phone ■ By smart meter
	What kind of software for billing system is using?	□ Enterprise Resource Planning (ERP) □ JICS □ Other

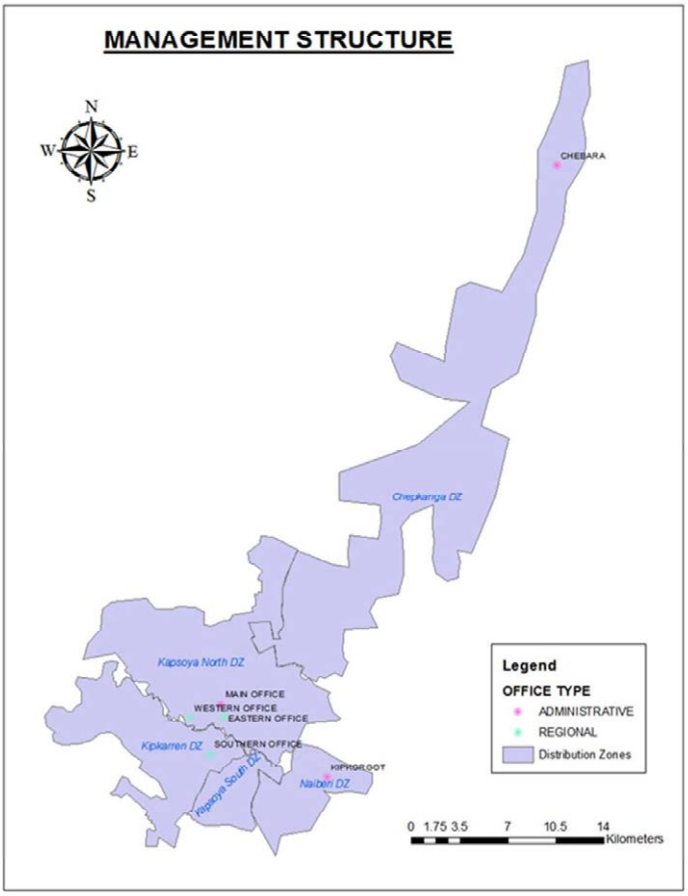
Attachment-1: Main Water Source

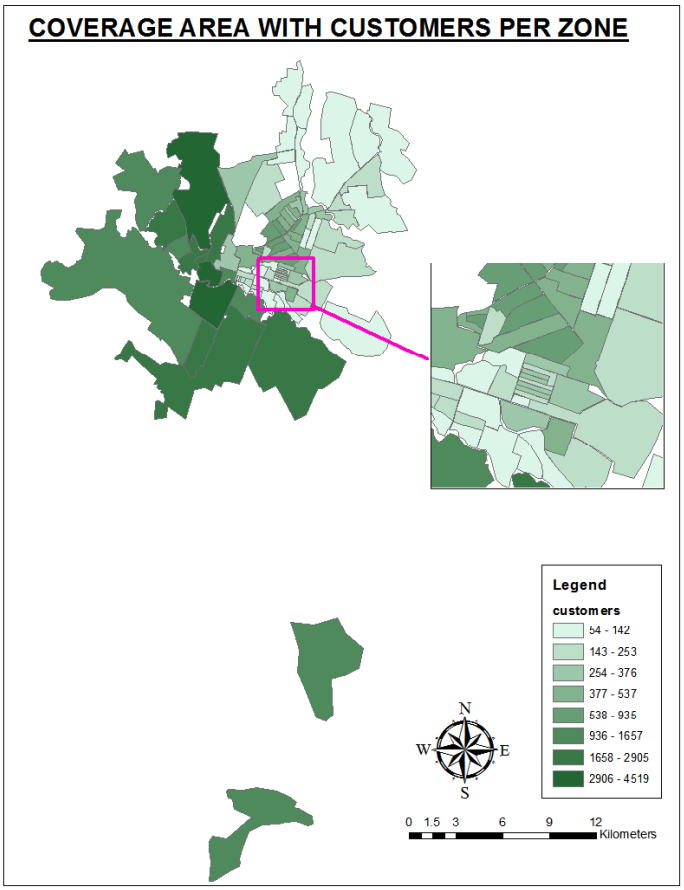
No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Moiben Dam along Moiben river. Located 60 kms Northeast of Eldoret Within Elgeyo Marakwet County.  		
2	Specifications of water source and intake facility	① Moiben Dam River commissioned in 1997	• Water source capacity: 34,000 m^3/day • Intake capacity: 1,416 m^3/hour, 34,000 m^3/day • Year Built: June 1994 - July1997 • Structure of intake facility (Elevation + 2346.23 masl): ◆ Earth Dam with 35 m high concrete intake tower	

		② Two Rivers Dam Reservoir	• Water source capacity: 14,950 m^3/day • Intake capacity: 622 m^3/hour, 14,950 m^3/day • Year Built: 1963 • Structure of intake facility (Elevation + N/A masl): ◆ Concrete Dame with a pipe intake	
		③ Ellegirini Dam	• Water source capacity: 9,000 m^3/day • Intake capacity: 375 m^3/hour, 9,000 m^3/day • Year Built: June 1994 - July1997 • Structure of intake facility (Elevation + N/A masl): ◆ Earth Dam with concrete intake tower	
3	Outstanding annual and seasonal fluctuation / trend, if any	① Moiben Dam	• Maximum intake: 974 m^3/h, 728,500 m^3/day (January 2021) • Minimum intake: The dam has been quite stable since commissioning and the spillway has never stopped overflowing • Moiben river is a permanent river. Refer to Source：ELDOWAS Figure 1.	
4	Future development plan	① Moiben Dam	• Intake capacity: The same intake to be maintained • Scheduled year: 2022/2023 • Purpose: To boost the water supply within Eldoret town and its environments.	
		② Two Rivers Dam	• Intake capacity: 74,000 m^3/day (New) • Scheduled year: 2023-2026 • Purpose: To be meet the expected future demand for Eldoret Town.	

Attachment-2: Management Structure and Area of Coverage

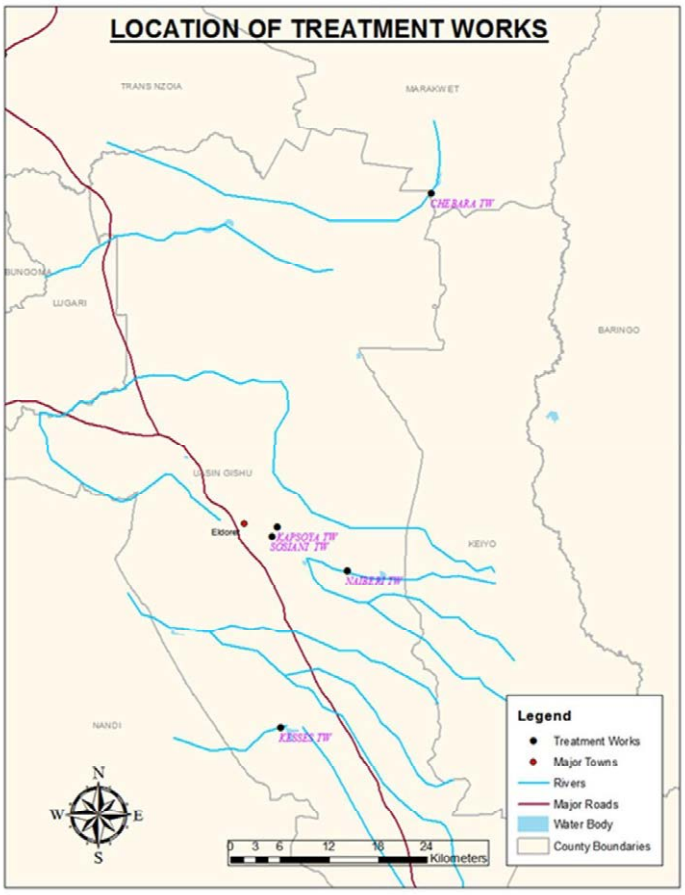
No.	Items	Details / Numbers / Specifications / Conditions	Note
1	Name and location of water supply area / county	① Eldoret Municipality area / Uasin Gishu county ② Kesses/Lessos area (Uasin Gishu-Nandi County) ③ Chebara and Chebiemit area (Elgeyo Marakwet County)	



				
2	General information of water supply area / county	① Eldoret Town and its environs (Uasin Gishu County)	• Population / Beneficiaries (2022): 424,190 • Household connections (2022): 64,460 • Water Kiosk: 59 • Total / coverage area: (2022): 420 km^2 • Average service hours (2020): 18 hours • Water Treatment Plant: Chebara, Kapsoya, Sosiani and Naiberi WTPs • Main water source: Moiben, Sosiani and Ellegrini Rivers • Current domestic water demand (year 2022: 62,000 m^3/day • Future domestic water demand (year 2040): 114,069 m^3/day	

		② Kesses Water Supply	• Population / Beneficiaries (2022): 24,845 • Household connections (2022): 1550 • Water Kiosk: 4 • Total / coverage area: (2022): N/A km^2 • Average service hours (2020): 24 hours • Water Treatment Plant: Kesses WTP • Main water source: Kesses Dam • Current domestic water demand (year 2020: 1707 m^3/day • Future domestic water demand (year 2040): 2748 m^3/day	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Chebara WTP ② Sosiani WTP ③ Kapsoya WTP ④ Naiberi WTP ⑤ Kesses WTP 		
2	Specifications of WTP	① Chebara WTP	• Type of treatment: Rapid filtration with coagulation + chlorine disinfection • Current treatment capacity (2022): 22,500 m^3/day • Design treatment capacity: 28,300 m^3/day • Year Built: 1995 • Structure of main facility: ◆ Receiving well: 107.25 m^3, 6.5 m×5.5 m ×3.0 m deep, retention time 1.5 min, RC ◆ Flocculation basin: None. Only chemical dosing channel, RC	

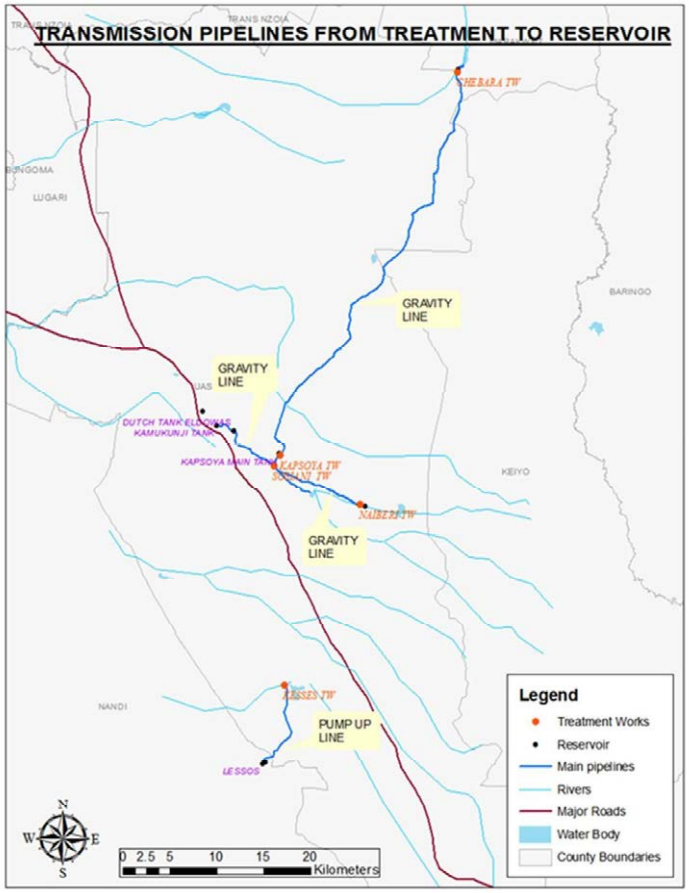
			◆ Sedimentation basin: N/A m^3, 13.7 m×10.2 m×4.6 m×7, Inclined plate 6 lines×7 set, RC ◆ Rapid sand filtration: Size Φ4.35 m×2.95 m×14, No. of cell: 14, filtration speed 5 $m^3/m^2/hr$, Material of filter: quartz sand media ◆ Clear water tank: 27 m x 7 m, Capacity: 550 m^3×2, RC	
		② Kapsoya WTP	• Type of treatment: Rapid filtration with coagulation + chlorine disinfection • Current treatment capacity (2022): 7000 m^3/day • Design treatment capacity: 7,000 m^3/day • Year Built: 2018 (Expansion) • Structure of main facility: ◆ Receiving well: 11.025 m^3, 2.1 m×2.1 m×2.5 m deep, retention time 1.5-2 min, RC ◆ Flocculation basin: None. Only chemical dosing channel RC with baffles ◆ Sedimentation basin: N/A m^3, 6.1m× 6.1 m×4.5 m×5 m, Inclined plate 6 lines×5 set, RC ◆ Rapid sand filtration: Size Φ4 m×3 m×5 m, No. of cell: 5, filtration speed 5.2 $m^3/m^2/hr$, Material of filter: quartz sand media ◆ Clear water tank: 1,360 m^3×2	

		③ Naiberi WTP	• Type of treatment: Rapid filtration with coagulation + chlorine disinfection • Current treatment capacity (2022): 1,200 m^3/day • Design treatment capacity: 2,000 m^3/day • Year Built: 2018 • Structure of main facility: ◆ Receiving well: 11.025 m^3, 2.1 m x 2.1m x 2.5m deep, retention time 1.5-2 min, RC ◆ Flocculation basin: helicoidal Flow Type (Spiral Flow Type) Hydraulic flocculator ◆ Sedimentation basin: 12 m×3 m×3.3 m×2, Inclined plate 2 lines×5 set, RC ◆ Rapid sand filtration: 4 m×3 m×2, No. of cell: 5, filtration speed 6.9 m^3/m^2/hr, Material of filter: quartz sand media ◆ Clear water tank: 500 m^3	
3	Water treatment conditions	① Chebara WTP	• Utilization of plant capacity: 83 % • Hours for WTP Utilization: 24/day • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process (2020) for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: 90 kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A Mil Ksh/year ◆ Labor cost: 8.5 Mil Ksh/year ◆ Chemical cost: 19.8Mil Ksh/year ◆ Electricity cost: 2.9 Mil Ksh/year ◆ Maintenance cost: N/A Mil Ksh/year ◆ Other cost: N/A Mil Ksh/year	

		② Kapsoya WTP	• Utilization of plant capacity: 83 % • Hours for WTP Utilization: 24/day • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process (2020) for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: 20 kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A Mil Ksh/year ◆ Labor cost: 5.4 Mil Ksh/year ◆ Chemical cost: 1.8 Mil Ksh/year ◆ Electricity cost: 0.38 Mil Ksh/year ◆ Maintenance cost: N/A Mil Ksh/year ◆ Other cost: N/A Mil Ksh/year	
		③ Naiberi WTP	• Utilization of plant capacity: 83 % • Hours for WTP Utilization: 24/day • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process (2020) for during the dry and rainy seasons: ◆ Sodium hypochlorite: 5 kg/day • Annual Operation and maintenance cost and its breakdown: N/A Mil Ksh/year ◆ Labor cost: 3.8 Mil Ksh/year ◆ Chemical cost: 0.66 Mil Ksh/year ◆ Electricity cost: 0.199 Mil Ksh/year ◆ Maintenance cost: N/A Mil Ksh/year Other cost: N/A Mil Ksh/year	
4	Water quality test	① Chebara WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on) • Compliance with water quality standards Refer to Table 2.	

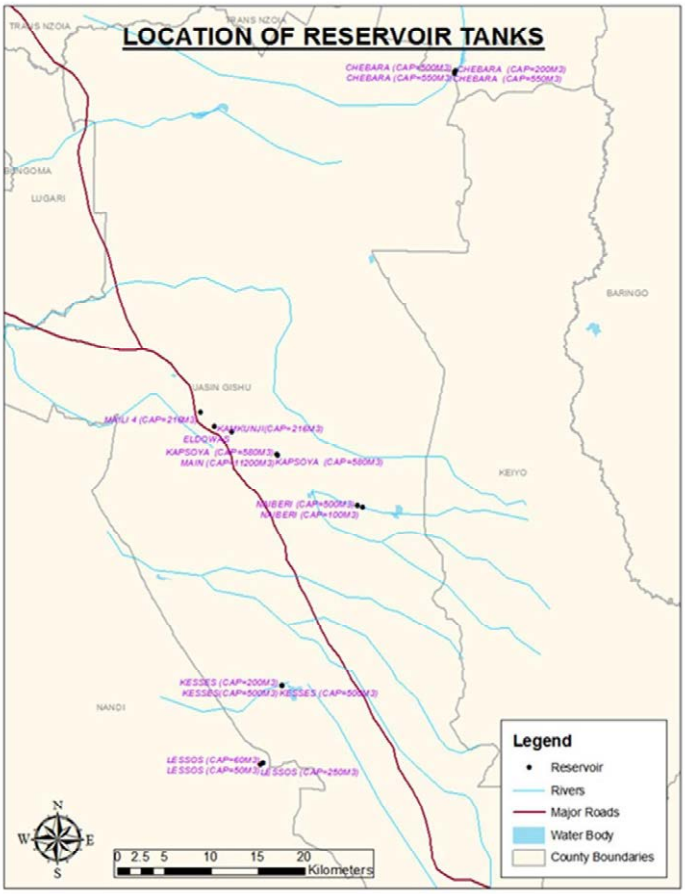
		② Kapsoya WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on) • Compliance with water quality standards Refer to Table 3.	
		Naiberi WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on) • Compliance with water quality standards Refer to Table 4.	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

<table>
<tr><th>No.</th><th>Items</th><th colspan="2">Details / Numbers / Specifications / Conditions</th><th>Note</th></tr>
<tr><td>1</td><td>Name and location map of transmission pipeline</td><td colspan="2">① Chebara Eldoret transmission line (Gravity)
② Kapsoya-Kao La Amani transmission line (Gravity)
③ Sosiani Dutch Church transmission line (Gravity)
 
</td><td></td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Specifications of Pipeline</td><td>① Chebara Eldoret line</td><td>• DN 600 35 km cement coated steel pipe DN500 15.5 Km cement coated steel pipe
• Year Built: 1993-1995
• NRW of main transmission line: 3% for last five years</td><td></td></tr>
<tr><td>② Kapsoya Kao La Amani</td><td>• DN 300 HDPE pipeline
• Year Built: Replaced in 2018
• NRW of main transmission line: 1%</td><td></td></tr>
</table>

		③ Sosiani Dutch line	• DN 500 bituminous coated steel pipe 6.5 km laid in 1986 • DN 400 AC pipe 7.5 km (Approx) laid in 1964 • NRW of main transmission line: 5% for last five years (Approximated)	
3	Future development plan	① Augmentation of Chebara line	• Scheduled year: 2022/2023 • Purpose: To be filled for your purpose of development such as to boost the water supply within Eldoret town to meet the demand in 2023	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Kasoya Reservoirs ② Dutch Church Reservoirs ③ Huruma Reservoirs ④ Maili Nne Reservoirs 		
2	Specifications of reservoir	① Kapsoya reservoir	• Current capacity (2022): 11,200 m^3/day • Year Built: March, 1995 • Structure of main facility: ◆ Reservoir: Type: underground, RC, ◆ Distribution pump- Gravity system ◆ Water flow measurement facility: type of water meter 2 no. Mechanical (Woltman Dn500 and DN 400	
		② Dutch Church reservoirs	• Current capacity (2022): 11,200 m^3/day, 9,200 m^3/day, 4,600 m^3/day, 2,273 m^3/day and 455 m^3/day	

			• Year Built: 1963, 1976, 1986 and 1995 • Structure of main facility: ◆ Reservoir: Type: underground, RC ◆ Distribution by gravity ◆ No Water flow measurement facility installed	
		③ Huruma Reservoirs ④ Maili Nne Reservoirs	• Current capacity (2022): 216 m^3 x3 • Year Built: 2011 • Structure of main facility: ◆ Reservoir: Steel tanks on elevated steel tower ◆ Distribution by gravity ◆ No Water flow measurement facility installed	
3	Operation and maintenance and Water quality test	① Kasoya Reservoirs ② Dutch Church Reservoirs ③ Huruma Reservoirs ④ Maili Nne Reservoirs	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	① Ole Tepes Reservoir	• Design capacity 10,000 m^3 RC ground tank • Scheduled year: 2023 • Purpose: retaining10,000 m^3 to boost the service hours by a minimum of 12 hours in Southern part of Eldoret town to meet the demand in 2030.	

Attachment-6: Water Distribution Mains

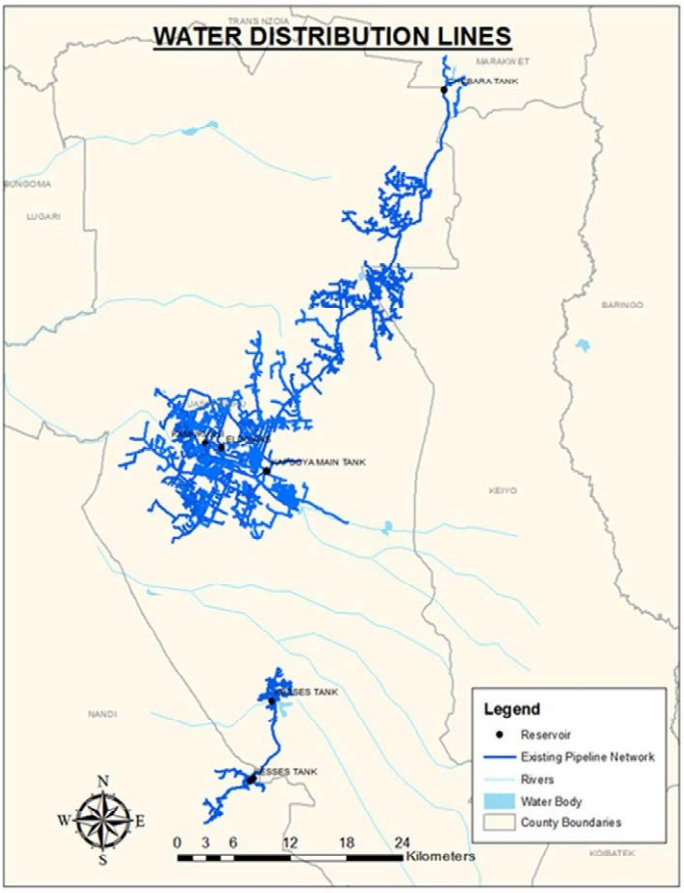
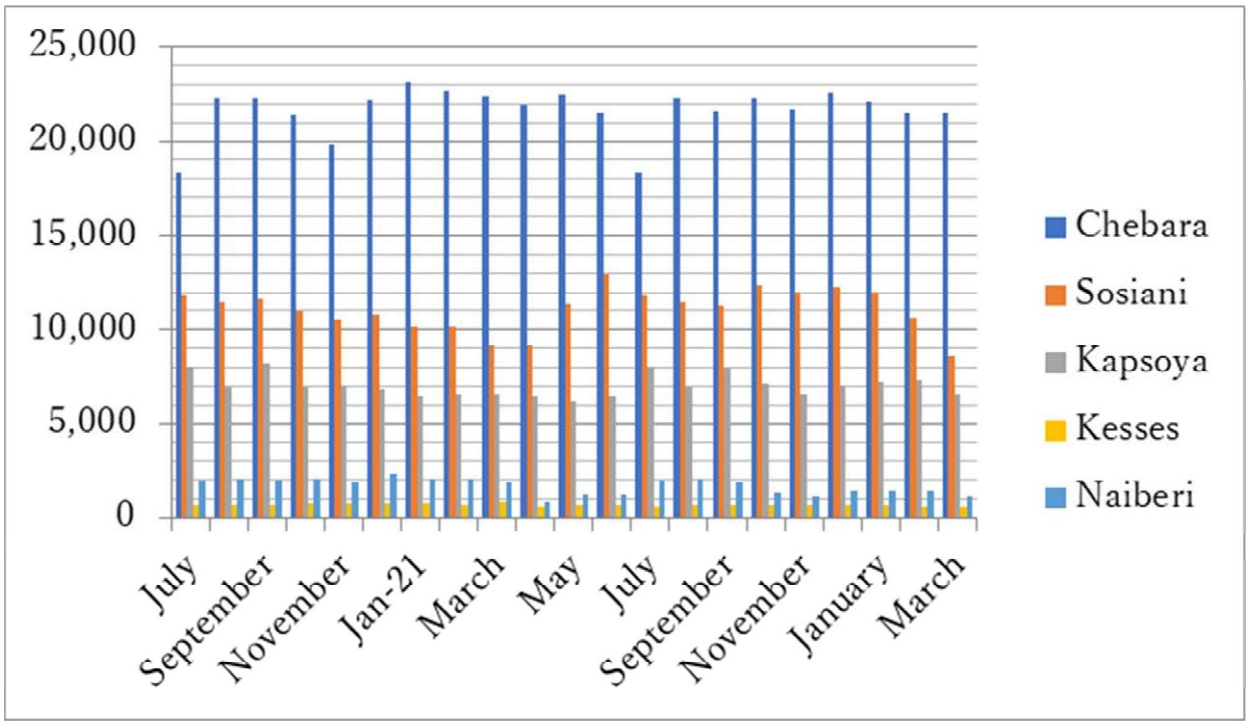
No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network			
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline Refer to Table 5. • Year Built: for each pipeline: N/A • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	• Continuous upgrade/replacement of the old pipelines as per tariff	

Table 1 Major Projects for Last 10 Years

	DESCRIPTION/PROJECT	DISBURSED/LOAN AMOUNT(KES)	AGENCY	FINANCIER
2013-14	Expansion of Chebara water works	308,181,873	LVNWWDA	Word Bank
2013-14	Kesses/Lessos Augmentation works	208,433,786	LVNWWDA	Word Bank
2017-18	Kapsoya/Elligrini Water Project (New loan)	542,648,688	LVNWWDA	Word Bank
2015-2021	County project	96,263,262	CCUG	CCUG
2011-2021	WSTF	51,159,140	WSTF	WSTF
	TOTAL	**1,206,686,749**		

Source：ELDOWAS



Source：ELDOWAS

Figure 1 ELDOWAS WTP Seasonal Fluctuation Trend

Table 2 Main Items and Compliance (Chebara WTP)

Parameter	No. of samples	No. within Accepted Range	Compliance to the Standards (%)
Raw Water			
pH	90	90	100%
Turbidity	180	178	98.9
Treated Water			
Residual chlorine	90	90	100%
Physic-chemical (pH and Turbidity)	180	178	98.8%

Source：ELDOWAS

Table 3 Main Items and Compliance (Kapsoya WTP)

Parameter	No. of samples	No. within Accepted Range	Compliance to the Standards (%)
Raw Water			
pH	90	90	100%
Turbidity	180	178	98.9
Treated Water			
Residual chlorine	90	90	100%
Physic-chemical (pH and Turbidity)	180	179	99.4%

Source：ELDOWAS

Table 4 Main Items and Compliance (Naiberi WTP)

Parameter	No. of samples	No. within Accepted Range	Compliance to the Standards (%)
Raw Water			
pH	90	90	100%
Turbidity	90	88	97.7%
Treated Water			
Residual chlorine	90	90	100%
Physic-chemical (pH and Turbidity)	180	178	98.8%

Source：ELDOWAS

Table 5 Distribution Mains Breakdown

Pipe size(mm)	Asbestos Cement	Gi	Gs	UPVC	HDPE	Total	%
50	-	13.71	-	208.38	102.74	374.83	7%
65	-	-	-	6.93	-	71.93	1%
75	-	10.36	-	87.67	-	173.03	3%
80	-	0.02	-	-	-	80.02	1%
90	-	-	-	-	51.78	141.78	3%
100	-	21.47	-	93.21	10.85	225.53	4%
110	-	-	-	-	-	110	2%
125	0.86	5.37	-	-	-	131.23	2%
150	5.95	25.7	0.05	62.53	-	244.23	4%
200	12.57	34.53	0.91	39.74	-	287.75	5%
250	-	5.95	-	-	-	255.95	5%
300	-	0.4	-	2.81	-	303.21	6%
315	-	-	-	-	-	315	6%
350	-	3.43	-	11.91	-	365.34	7%
375	7.14	0.09	-	-	-	382.23	7%
400	-	11.82	-	3.07	-	414.89	8%
429	-	5.04	-	-	-	434.04	8%
500	-	26.3	-	-	-	526.3	10%
600	-	43.21	-	-	-	643.21	12%
Sum						5480.5	100%

Source：ELDOWAS

WSP-10

Kisumu WSP (KIWASCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (KIWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	Refer to Table 1.
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Strategic plan 2017-2022, pg 54-61】 • Strategic Priority 1: Water and Wastewater Infrastructure Development. • Objective 1.1: Increase Water Coverage from 73% to 87% • Objective 1.2: Increase Sewerage Coverage from 16% to 30% • Strategic Priority 2: Operational efficiency • Objective 2.1: Reduce Non-Revenue Water from 37% to 20% • Objective 2.2: Improve Operational Efficiency of the Sewer and Water Networks
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. We are working on a proposal to the WSTF on AOD (Aid on Delivery) on 1) Proposed sewer network densification in Migosi - Lolwe Estate: KES 53,093,879.01 2) Proposed Kachok – Orongo Water Reticulation Improvement: KES 65,622,286.52 Project cost: KES118,716,165.53
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】

No.	Questions	Answers
7	What is the reason for the inactive connections?	□ No payment ■ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Customer care clinics by the corporate assistants
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	39,000 m^3/day (Both the qualitative and quantitative factors were considered, while using the Water Design Manual 2005.)
10	Kindly provide the details for the water demand projection with calculation method and excel file.	N/A.
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	□ Enough to develop the future demand ■ Enough for current demand (Not able to supply due to inadequate water at the source (Kajulu river), inadequate transmission mains and geographical locations) □ Not enough ■ Need additional water sources (To supply the Western and Eastern parts of the Lake Victoria to supply Riat Hills and areas bordering Nairobi road effectively)
	2) Raw Water Quality	■ Meet the standard for drinking purpose (Turbidity of river water goes up to 3,500 NTU during rainy season.) ■ Meeting the standard but deteriorating (Pollution of the Lake by industries effluents. Adverse effect of water hyacinth and new challenges of cyanobacteria.)

No.	Questions	Answers
	3) Intake Facility	
	Intake Volume	■ Not sufficient for future water demand (For river water due to climate change) ■ Sufficient for current demand (Lake water is sufficient but very high energy costs – efficiency challenges) □ Not sufficient for current demand
	Facility Condition	□ Good □ Fair □ Deteriorating but can utilize ■ Need rehabilitation and augmentation
	4) Raw Water Transmission System	
	Transmission Volume	□ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good □ Fair ■ Deteriorating but can utilize (Old /C pipes from intake to TW) ■ Need rehabilitation and augmentation
	5) Water Treatment Plant	
	Treatment Volume	■ Not sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair (For TW 1 and 2 but not efficient) □ Deteriorating but can utilize ■ Need rehabilitation and augmentation (TW3)

No.	Questions	Answers
	6) Water Distribution Systems Water Pressure	□ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure (Due to old asbestos lines and weak uPVC pipes in the network, pressurized lines interconnected with gravity; old appurtenances therefore intermittency and inefficient and high cost O&M) □ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	□ Using the saddle clamp with cock ■ Using the saddle clam (with gate valves) ■ Using the tee (with gate valves)
	8) Water Meter	■ Using the piston type ■ Using propeller type Reason of selecting above: Piston type are used mainly for domestic accounts for efficiency. Propeller type are used in bulk meters and areas affected by silt and are also cost effective and easy to maintain.
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe (39%) ■ Poor material use (5%) ■ High pressure (4%) ■ Meter inaccuracy (28%) ■ Illegal connection (10%) ■ Poor workmanship (3%) ■ Others: Vandalism by read constructors (11%)
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	□ By manual ■ By smart phone (Physical visits) ■ By smart meter (Made in China, 124 number on large consumers) ■ Enterprise Resource Planning (ERP) □ JICS □ Other

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Kajulu River ② Dunga Lake Refer to Source：KIWASCO Figure 1.		
2	Specifications of water source and intake facility	① Kajulu River	• Water source capacity: 36,000 m^3/day • Intake capacity: 1,500 m^3/hour, 36,000 m^3/day • Year Built: 2014 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		② Dunga Lake	• Water source capacity: 44,000 m^3/day • Intake capacity: 2,000 m^3/hour, 44,000 m^3/day • Year Built: 2011 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	① Kajulu River	• Maximum intake: 1,300 m^3/h, (7 months in 1 year) • Minimum intake: 500 m^3/h, (5 months in 1 year) • Permanent river or seasonal river: Seasonal	
4	Future development plan	① Kajulu River ② Dunga Lake	• Intake capacity: 30,000 m^3/day (Additional including source improvement, and efficiency improvement) • Scheduled year: Immediate • Purpose: To boost the water supply within service area, stabilize production	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	① 297 km^2 within Kisumu County Refer to Source：KIWASCO Figure 2.		
2	General information of water supply area / county	① 297 km^2 within Kisumu County	• Population / Beneficiaries (2021): 506,453 / 595,552 • Household connections: N/A • Water Kiosk: N/A • Total / coverage area: (2022): N/A km^2 • Average service hours (2020): N/A • Water Treatment Plant: N/A • Main water source: N/A • Current domestic water demand: N/A • Future domestic water demand: N/A	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Kajulu WTP ② Dunga WTP Refer to Source：KIWASCO Figure 3.		
2	Specifications of WTP	① Kajulu WTP ② Dunga WTP	• Type of treatment: Conventional system rapid filtration with coagulation + chlorine disinfection • Current treatment capacity: N/A m^3/day • Design treatment capacity: N/A m^3/day • Year Built: N/A • Structure of main facility: N/A	
3	Water treatment conditions	① Kajulu WTP ② Dunga WTP	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	① Kajulu WTP ② Dunga WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	Refer to Source：KIWASCO Figure 4.		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: Refer to Table 2. Year Built: for each pipeline: Refer to Table 2. • NRW of main transmission line: N/A% • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Kajulu Contact Tank ② Obwolo Tank ③ Riat Ground and Elevated Tanks ④ Coptic Tank ⑤ Kanyamedha Tanks ⑥ Kibuye Reservoir Tanks ⑦ Watson Tank ⑧ Dunga Contact Tanks Refer to Source：KIWASCO Figure 5.		
2	Specifications of reservoir	① Kajulu Contact Tank ② Obwolo Tank ③ Riat Ground and Elevated Tanks ④ Coptic Tank ⑤ Kanyamedha Tanks ⑥ Kibuye Reservoir Tanks ⑦ Watson Tank ⑧ Dunga Contact Tanks	• Current capacity: Refer to Table 3. • Year Built: Refer to Table 3. • Structure of main facility: ◆ Reservoir: N/A ◆ Distribution pump: N/A ◆ Water flow measurement facility: N/A ◆ Generator facility: N/A	

3	Operation and maintenance and Water quality test	① Kajulu Contact Tank ② Obwolo Tank ③ Riat Ground and Elevated Tanks ④ Coptic Tank ⑤ Kanyamedha Tanks ⑥ Kibuye Reservoir Tanks ⑦ Watson Tank ⑧ Dunga Contact Tanks	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	N/A	N/A	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	Refer to Source：KIWASCO Figure 6.		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline Refer to Table 4. Year Built: for each pipeline: Refer to Table 4. • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	N/A	

Table 1 KIWASCO Last 10 Years Project

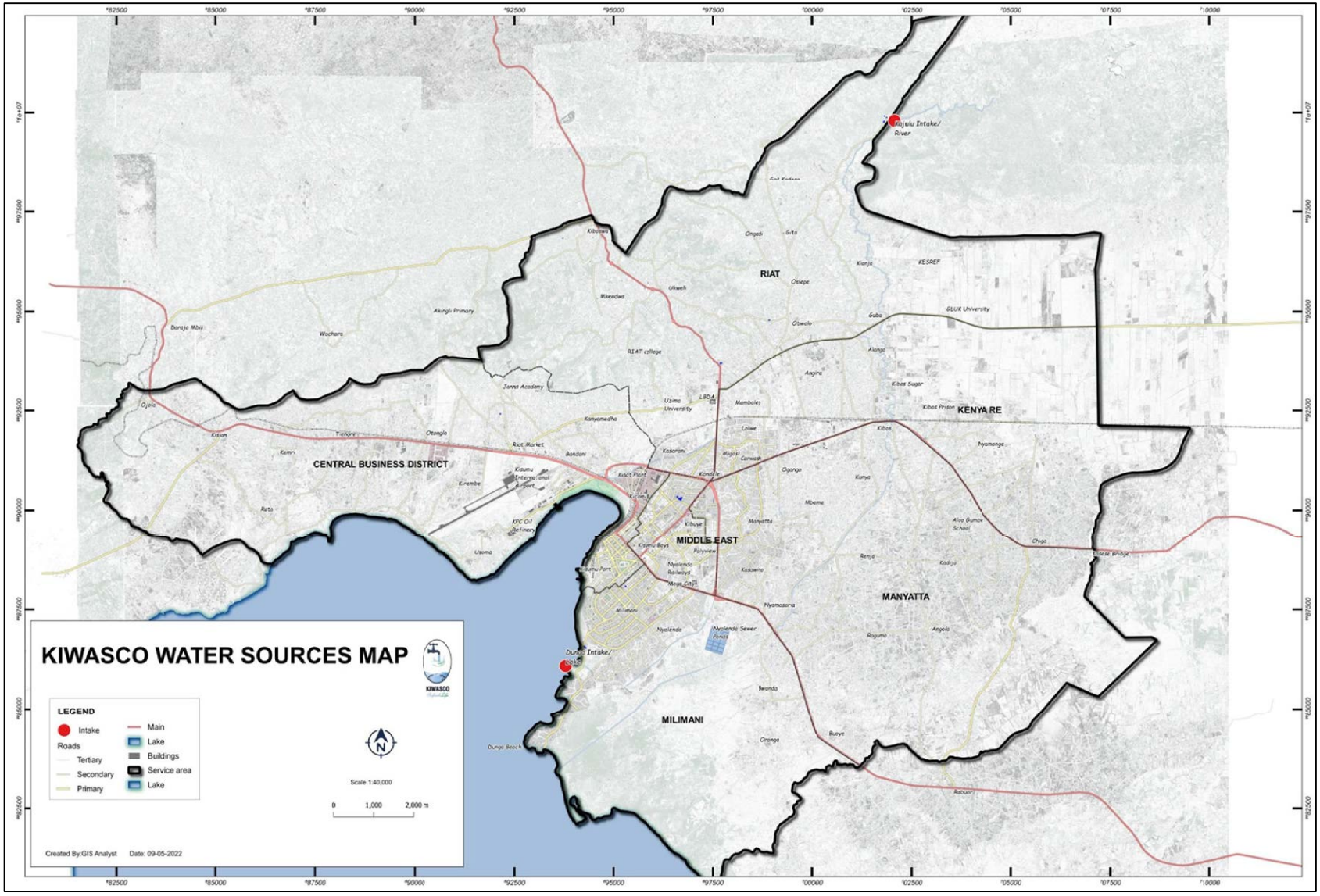
Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
Kisumu Water Supply and Sanitation Project		GoK, World Bank					
Phase 1 Short term action plan			2006	2007	Restoring Capacity of Dunga Intake to 21,500m3/day	100% complete	2,500,000,000
Phase 2 Long term action plan Phase 1: Emergency works Phase 2:			2009	2013	Improving Dunga Source to 45,000m3/d Improvement of Water distribution systems and Reservoirs, Kajulu Intake works, 36,000m3/day Kajulu Water Treatment Plant, Raw Water Pipeline, Rehabilitation of Wastewater at Nyalenda Lagoon and Pumping Stations	100% complete	
OBA Project	Punjani Electrical & Hardware Ltd.	KIWASCO/ WSTF/ WB	Aug-17	Feb-19	Construct a Pump house, 5m wide access road to the pump house with: Drainage to the structure above ground, Gutters (Including all fittings), Downpipes (Including fittings) and Cover to internal floor drains and ducts; Pipework, fittings and valves to and from the pumps; Supply and installation pumps and electrical works	100% complete	113,000,000

Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
OBA Project	IRRICO International Ltd.	KIWASCO/ WSTF/ WB	Aug-17	Feb-19	Construction of approximately 33km of pipeline, gravity mains from high level tanks at Riat hills, rising mains from ground level tanks at Riat, construction of 21m high Elevated pressed steel tank of 75m3 and construction of 229m3 ground level Pressed Steel tank.	100% complete	
KISIP		Kisumu County Government	Early 2018	Apr-19	Construct Trunk Main lines and Laterals within Obunga and Bandani	100% complete	
Nehru Road	Ricardo Building Contractors & Titan Building Concepts	KIWASCO	Oct-18	Feb-19	Construct an 8" sewer line and manhole chambers in Millimani's Nehru Road	100% complete	6,123,864.28
DAGO Phase II Network Extension	Rawelo Construction Company	KUAP	Dec-18	Jan-19	Construction of 2,656m of Water network (7Number Lines) - Provision, Excavating, laying, backfilling and testing of the 2" UPVC pipelines and installation of the appurtenances; Cutting off Lines off-taking from the main lines and connecting them to the created DMM lines; Construction of 2 Number Kiosks	100% complete	2,107,330.00

Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
Sondu Overhaul & Relocation Works	Jaycon Services Kenya Ltd.	KIWASCO-NYANAS/KeNHA	August 21, 2020	SUSPENDED	Relocation of 7,152m of assorted sizes of uPVC Pipelines with appurtenances and connections along the Kisii-Ahero A1 Highway	<50% Complete	51,757,758.80
	Planet Technical Solutions Limited	KIWASCO-NYANAS/KeNHA	August 21, 2020	SUSPENDED	Relocation of 2,039m of uPVC pipeline within Sondu town from the Kisii-Ahero A1 Highway to Agai Secondary School	>70% Complete	3,046,714.00
	Titan Building Concept Limited	KIWASCO-NYANAS/KeNHA	August 21, 2020	SUSPENDED	Relocation of 11,032m of uPVC pipeline within Sondu town from Nyabondo hospital to Nyakach Girls' High School	>80% Complete	31,903,059.95
Improvement of Water Supply to Nyabondo Trauma Centre	Titan Building Concept Limited	KIWASCO-NYANAS/ KeNHA			Extension of 120m of Pipeline to Trauma Centre	100% Complete	502,200.00
PA/Safaricom Mpesa Foundation Project	WADU Construction Company	PA/SAFARICOM			Connection of 150Number households in Nyalenda B	100% Complete	3,166,487.70
Tumaini Roundabout Monument Construction	Building Concepts Ltd	KIWASCO	July 15th 2021	October 25th 2021		95% Complete	2,345,664.00
WSTF CLSG (QSQF) PROJECT	Building Concepts Ltd	WSTF/GoK	April 1st 2021	June 30, 2021	Construction of 11Number Handwash Points at vulnerable areas in Kisumu town	11 out of 11 complete	905,590.80

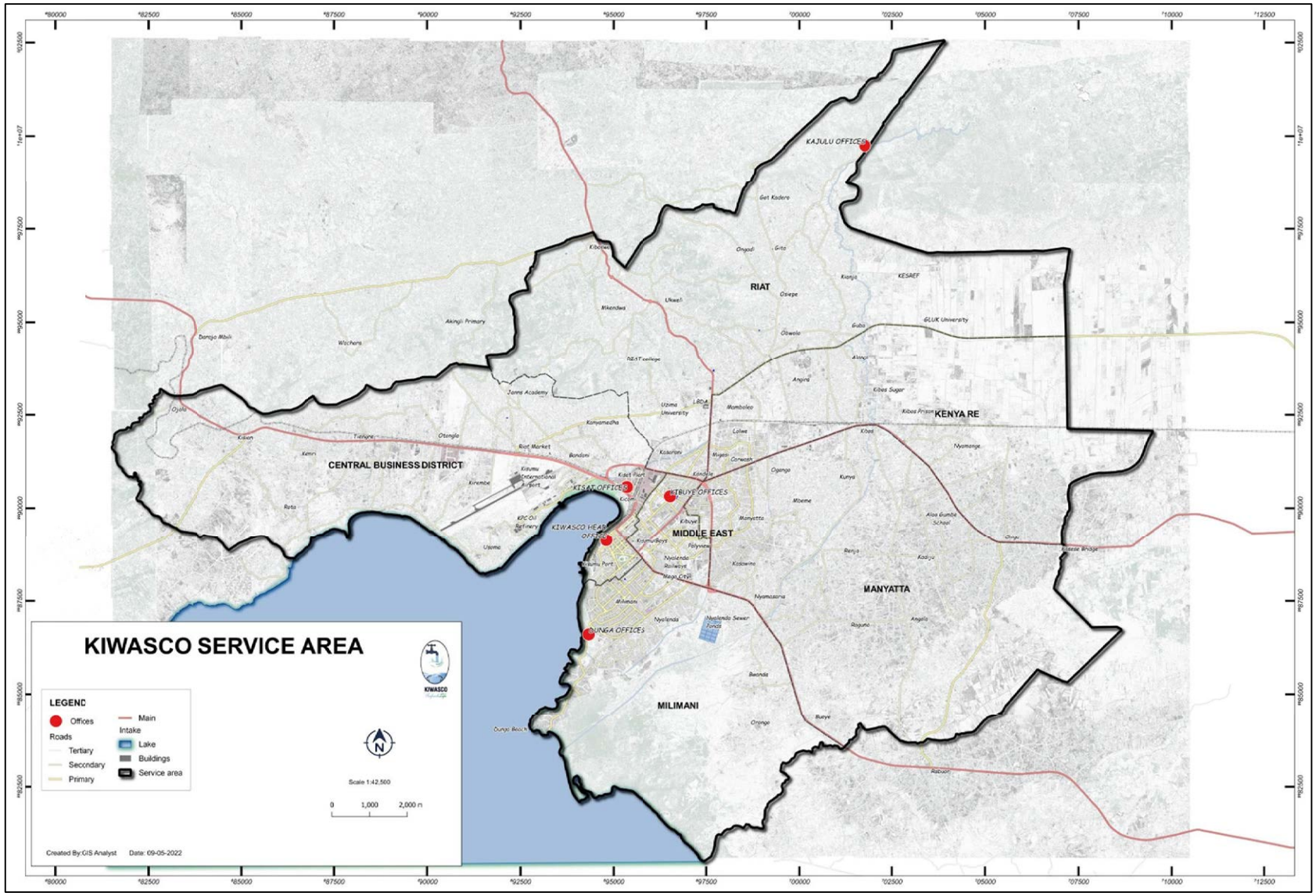
Project Name	Contractor	Client / Financier	Commence Date	Completion Date	Scope	Status	Project Cost
	Framoc Agencies & Shavanna Contractor		April 1st 2021	June 30, 2021	Connection of 200Number households	100% Complete	4,284,000.00
	Ricardo Building Contractors & Titan Building Concepts		April 1st 2021	June 30, 2021	Extensions and overhauls of 1,943m of pipeline in Bandani and Kogony Low-Income areas	100% Complete	3,526,353.04
Rehabilitation of 20Nr Migosi Sewer manholes	Framoc Agencies Ltd	KIWASCO	October 18th 2021	December 18th 2021	Raising of 20Nr sewer manholes c/w Insitu cast RCC covers	100% complete	1,112,830.00
Construction and Repair of 41Nr DMM Chambers	Okquims General Supplies Agencies Ltd	KIWASCO	October 18th 2021	December 18th 2021	Demolition and construction of RCC chambers c/w Insitu cast RCC concrete covers with lockable accesses	100% Complete	2,126,590.00

Source：KIWASCO



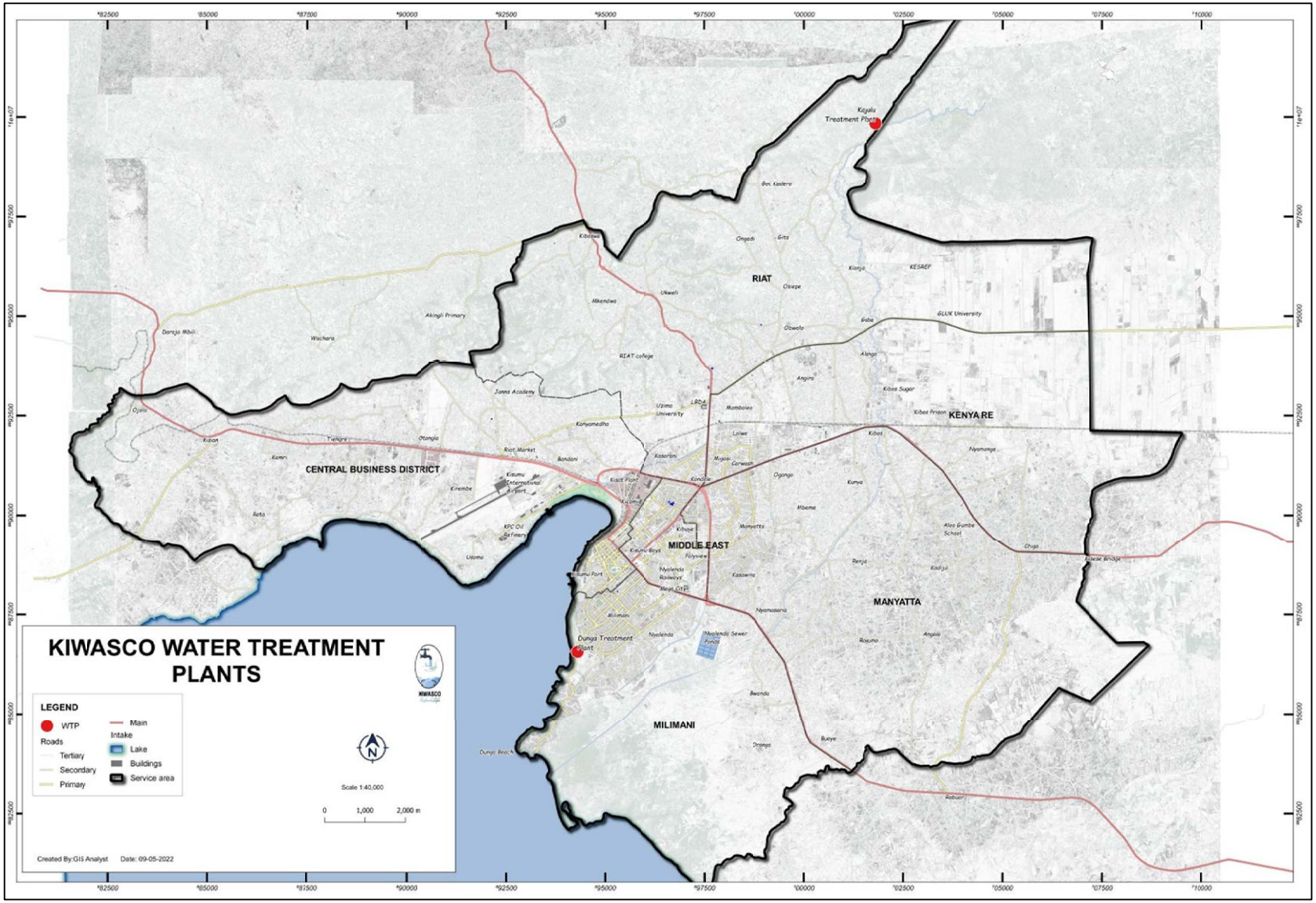
Source：KIWASCO

Figure 1 KIWASCO Water Source



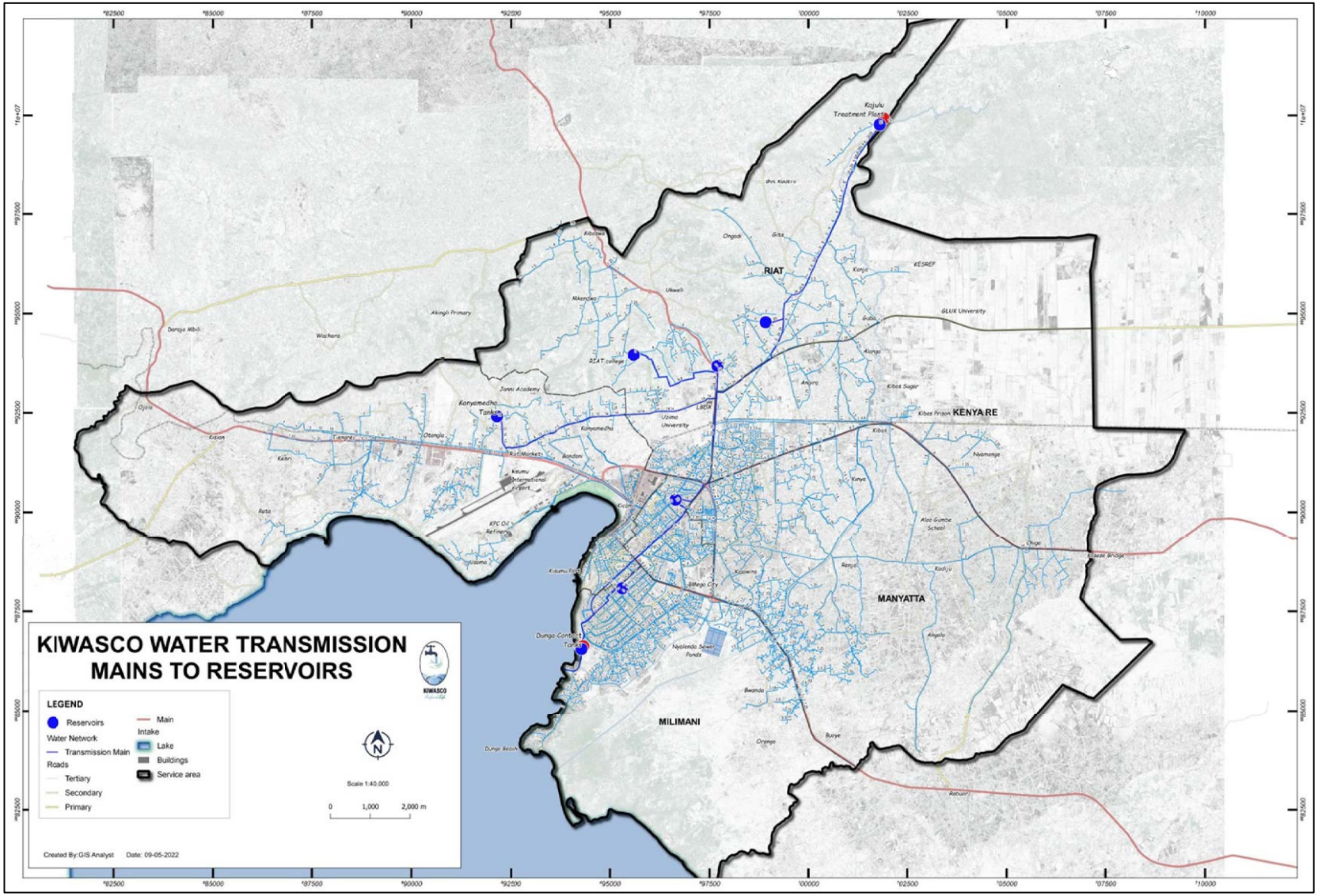
Source：KIWASCO

Figure 2 KIWASCO Service Area



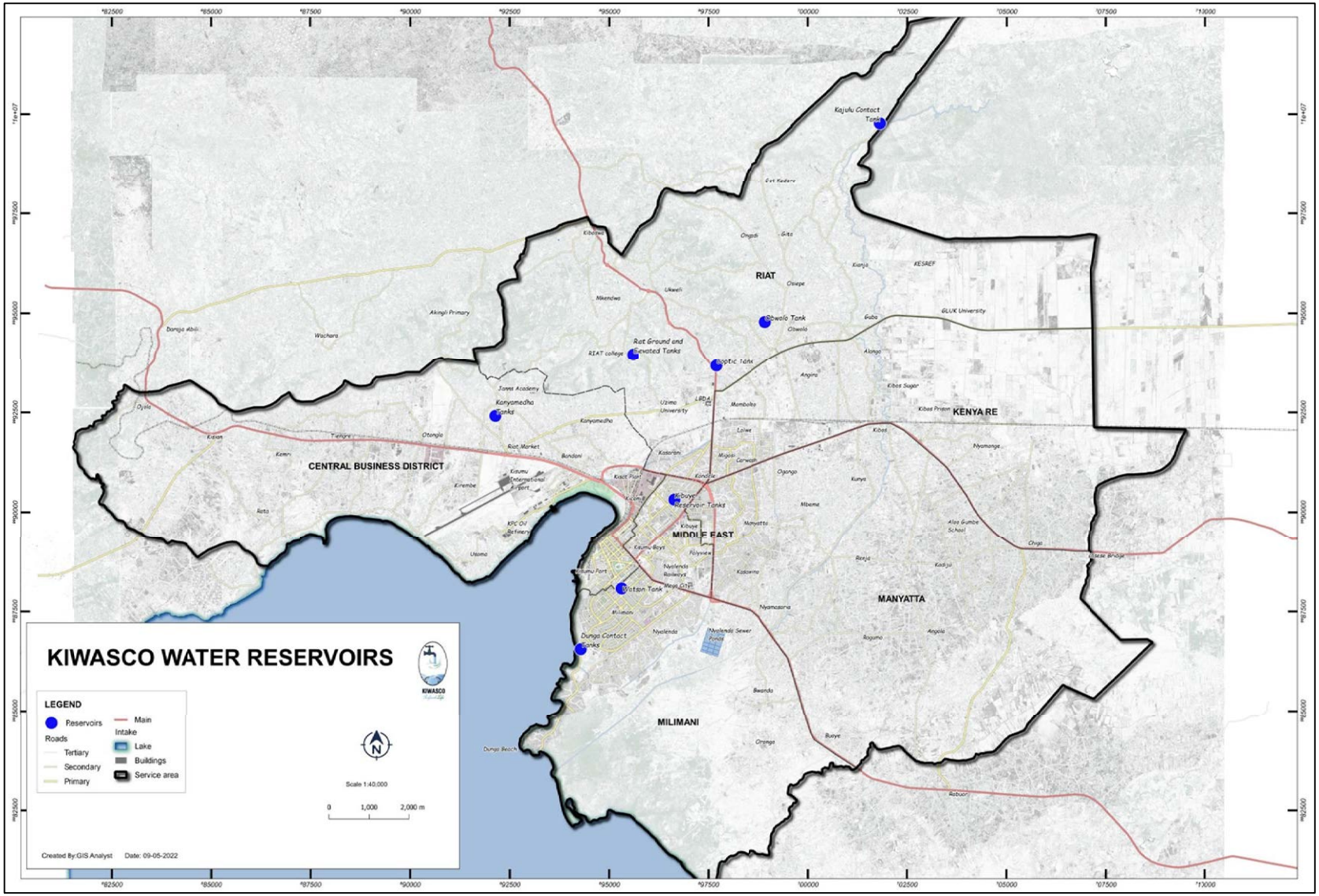
Source：KIWASCO

Figure 3 KIWASCO WTP



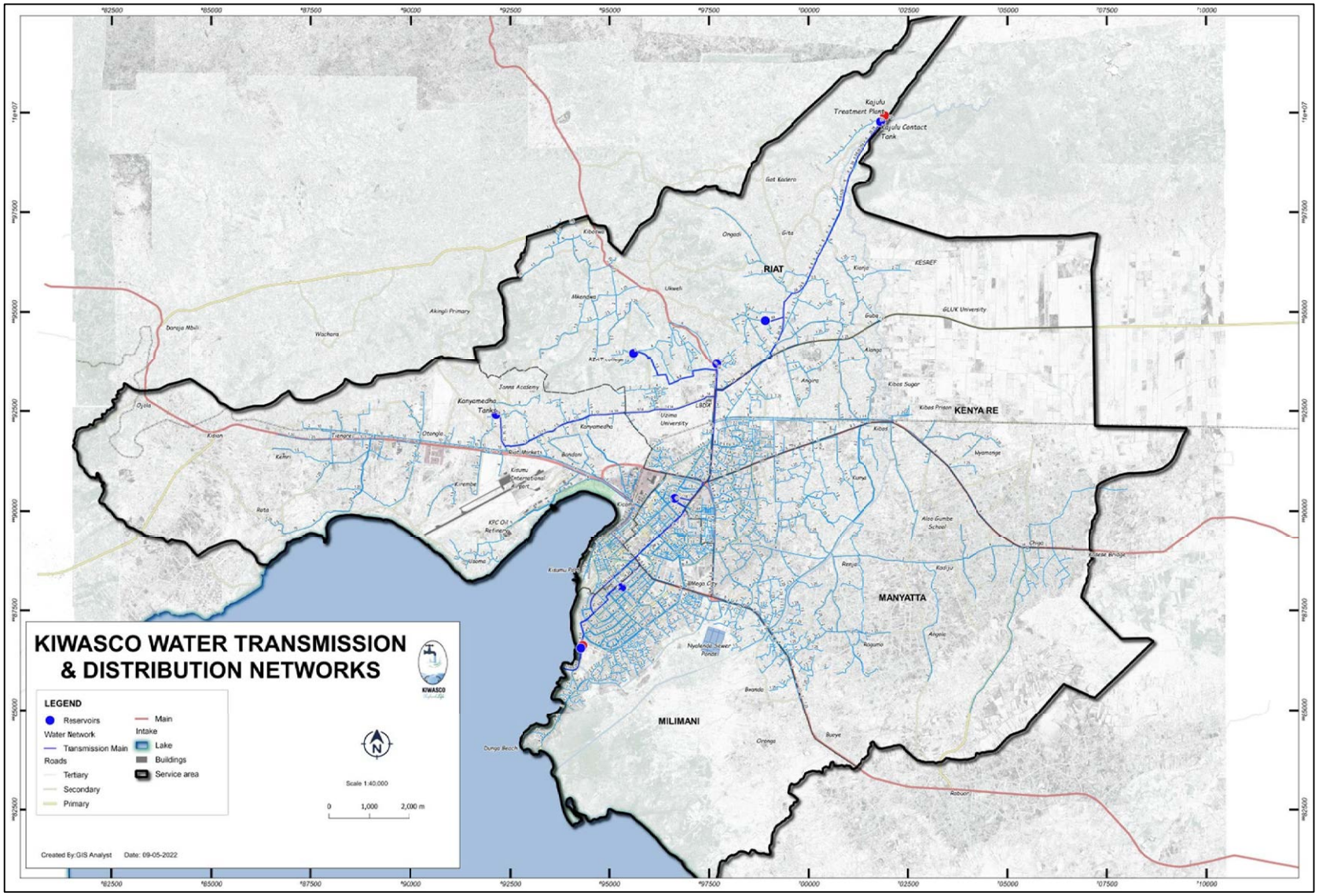
Source：KIWASCO

Figure 4 KIWASCO Water Transmission Mains to Reservoirs



Source：KIWASCO

Figure 5 KIWASCO Water Reservoirs



Source：KIWASCO

Figure 6 KIWASCO Water Transmission & Distribution Networks

Table 2 Water Transmission Mains Breakdown

Pipe Size (inches)	Length (km)	Pipe Material	Year of Installation	Condition
28	4.970	Epoxy coated cement lined steel pipe	2011	New
26	0.225	Epoxy coated cement lined steel pipe	2011	In use
24	13.681	Epoxy coated steel pipe	2011	In use
16	2.008	Epoxy coated steel pipe	2011	In use
14	12.915	Epoxy coated Steel pipe/uPVC	2011	In use
12	3.612	Epoxy coated Steel pipe/uPVC	-	In use
10	8.319	Asbestos Cement	-	In use

Source：KIWASCO

Table 3 KIWASCO Water Reservoirs

Location (area)	Type	Year of installation	Capacity (m^3)	In use/not in use (reason)
Watson Bank	Masonry	1954	2,000	In Use
Kanyamedha	Masonry	2012	2,100	In Use
Coptic	Masonry	2012	5,000	In Use
Obwolo	Masonry	2012	1,300	In Use
Riat Elevated	Steel	2018	82	In Use
Riat Ground tank	Masonry	2018	229	In use
Kibuye A1	Masonry	2011	6,000	In Use
Kibuye A2	Masonry	2011	6,000	In Use
Kibuye Rectangular	Masonry	1985	5,000	Not in use (Leaking)
Kibuye B	Masonry	1958	910	In Use
Kibuye C	Masonry	1958	455	In Use
Kibuye Domestic I	Elevated steel	1958	100	In Use
Kibuye Domestic II	Elevated steel	1958	125	Not in use (Leaking)
Dunga T/Works A	Masonry	1954	1,400	In Use
Dunga T/Works B	Masonry	1958	700	In Use
Dunga T/Works C	Masonry	2011	500	In Use
Kajulu T/Works	Masonry	2012	5,000	In use
TOTAL Active			31,776	
Total inactive			5,125	
TOTAL			37,901	

Source：KIWASCO

Table 4 Water Distribution Mains Breakdown

Pipe Size (inches)	Length (km)	Pipe Material	Year of Installation	Condition
9	8.325	Asbestos/uPVC	Were constructed in different years cutting across the whole water network	Good
8	27.267	uPVC	2011	Good
24	3.180	Epoxy coated Steel pipes	2011	Good
16	2.008	Epoxy coated steel pipe	2011	
6	39.756	Asbestos	2011	Good
12	1.1100	HDPE	-	Good
5	3.017	Asbestos	-	Good
Grand Total	506.016			

Source：KIWASCO

WSP-11

Nzoia WSP (NZOWASCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (NZOWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	• Kibabii - Chebyuk Water Supply: USD 5.36M (Korea International Cooperation Agency (Koïca))
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Strategic Plan 2019-2022, Annex 1】
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. 【Strategic Plan 2019-2022, Annex 2】
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】
7	What is the reason for the inactive connections?	■ No payment ■ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Billing messages • Marketing teams • Barazas
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	N/A
10	Kindly provide the details for the water demand projection with calculation method and excel file.	N/A

No.	Questions	Answers
11	Challenges Faced in the Water Supply Facilities	
	1) Potential of Water Source	□ Enough to develop the future demand □ Enough for current demand ■ Not enough (Kimilili water supply plant needs rehabilitation of the intake. The intake is shared with a community irrigation scheme. During drought, abstraction is completely reduced to an extend that no water is available for treatment and supply.) □ Need additional water sources
	2) Raw Water Quality	□ Meet the standard for drinking purpose ■ Meeting the standard but deteriorating
	3) Intake Facility	
	Intake Volume	□ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good □ Fair □ Deteriorating but can utilize ■ Need rehabilitation and augmentation (Nzoia Treatment Plant needs rehabilitation. There is enough water for abstraction but the plant is old and needs urgent attention)
	4) Raw Water Transmission System	
	Transmission Volume	□ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	5) Water Treatment Plant Treatment Volume Facility Condition	 □ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand □ Good □ Fair ■ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	 □ Meeting the standards for water pressure □ Not all area meeting the standards for water pressure ■ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	□ Using the saddle clamp with cock ■ Using the saddle clam (with gate valve) ■ Using the tee (with gate valve)
	8) Water Meter	□ Using the piston type ■ Using propeller type Reason of selecting above:
	9) Non-Revenue Water (NRW) Reason and each percentage	 ■ Old pipe □ Poor material use □ High pressure ■ Meter inaccuracy ■ Illegal connection □ Poor workmanship □ Others
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	 ■ By manual ■ By smart Phone □ By smart meter □ Enterprise Resource Planning (ERP) □ JICS □ Other: Manual

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Kapolet River ② Nzoia River ③ Bungoma (Matisi) River ④ Webuye (Nabuyole) River ⑤ Kimili (Kamtiong) River ⑥ Terem River ⑦ Kapkateny River ⑧ Chesikaki River		
2	Specifications of water source and intake facility	① Kapolet River ② Nzoia River ③ Bungoma (Matisi) River ④ Webuye (Nabuyole) River ⑤ Kimili (Kamtiong) River ⑥ Terem River ⑦ Kapkateny River ⑧ Chesikaki River	• Water source capacity: N/A. • Intake capacity: N/A. • Year Built: N/A • Structure of intake facility (Elevation +N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	N/A	• Maximum intake: N/A • Minimum intake: N/A • Permanent river or seasonal river: N/A	
4	Future development plan	N/A	N/A	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	① Bungoma County ② Trans-Nzoia Refer to Source：NZOWASCO Figure 1.		
2	General information of water supply area / county	① Bungoma County ② Trans-Nzoia	• Population / Beneficiaries: Refer to Table 1. • Household connections: N/A • Water Kiosk: N/A • Total / coverage area: (2022): N/A km^2 • Average service hours: N/A • Water Treatment Plant: N/A • Main water source: N/A • Current domestic water demand: N/A • Future domestic water demand: N/A	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP Refer to Source：NZOWASCO Figure 2.		
2	Specifications of WTP	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP	• Type of treatment: Refer to Table 2 • Current treatment capacity: Refer to Table 2. • Design treatment capacity: Refer to Table 2. • Year Built: Refer to Table 2 • Structure of main facility: N/A	

3	Water treatment conditions	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	① Kapolet WTP ② Matisi WTP ③ Kimilili WTP ④ Nabuyole WTP ⑤ Nzoia WTP ⑥ Kapkateny WTP ⑦ Terem WTP	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	① Bungoma Town: 189km ② Kitale Town: 250km ③ Webuye: 167km ④ Kimilili: 165km		
2	Specifications of Pipeline	① Bungoma Town ② Kitale Town ③ Webuye ④ Kimilili	• Location, materials, diameter and length of each pipeline: CPVC and ferrous steel for main lines. • Year Built: for each pipeline: N/A • NRW of main transmission line: N/A % • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Mabanga Water Reservoir ② Nabuyole Storage ③ Southern Compound Kitale Storage Tanks ④ Nothern compound Kitale Storage Tanks ⑤ Chwele Water Storage Tank		
2	Specifications of reservoir	① Mabanga Water Reservoir ② Nabuyole Storage ③ Southern Compound Kitale Storage Tanks ④ Nothern compound Kitale Storage Tanks ⑤ Chwele Water Storage Tank	• Current capacity: Refer to Table 3. • Year Built: Refer to Table 3. • Structure of main facility: ◆ Reservoir: N/A ◆ Distribution pump: N/A ◆ Water flow measurement facility: N/A ◆ Generator facility: N/A	

3	Operation and maintenance and Water quality test	① Mabanga Water Reservoir ② Nabuyole Storage ③ Southern Compound Kitale Storage Tanks ④ Nothern compound Kitale Storage Tanks ⑤ Chwele Water Storage Tank	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	N/A	N/A	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	Webuye distribution network: Refer to Source：NZOWASCO ① Figure 3. Kimilili distribution network or DMA: Refer to Source：NZOWASCO ② Figure 4. Bungoma Water distribution network: Refer to Source：NZOWASCO ③ Figure 5. Kitale Water distribution network: Refer to Source：NZOWASCO ④ Figure 6.		
2	Specifications of Pipeline	① Webuye distribution network ② Kimilili distribution network or DMA ③ Bungoma Water distribution network ④ Kitale Water distribution network	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	N/A	

Table 1 NZOWASCO Service Area

Water Supply Scheme	Town Served	Current Target Population	Population Served	Scheme Type
Kapolet	Kitale	139,671	122,344	Kapolet – Gravity
Nzoia	-	-	-	Nzoia – Two stage Pumping
Bungoma (Matisi)	Bungoma	94,500	55,124	Two stage Pumping
Webuye. (Nabuyole)	Webuye	67,870	58,922	Single stage Pumping
Kimilili (Kamtiong)	Kimilili	78,567	63,127	Gravity
Terem.	Chwele	39,000	12,000	Gravity
Kapkateny	Chwele, Bokoli	35,000	9,600	Gravity
Chesikaki	Sirisia	32,000	12,000	Gravity

Source：NZOWASCO

Table 2 NZOWASCO WTP

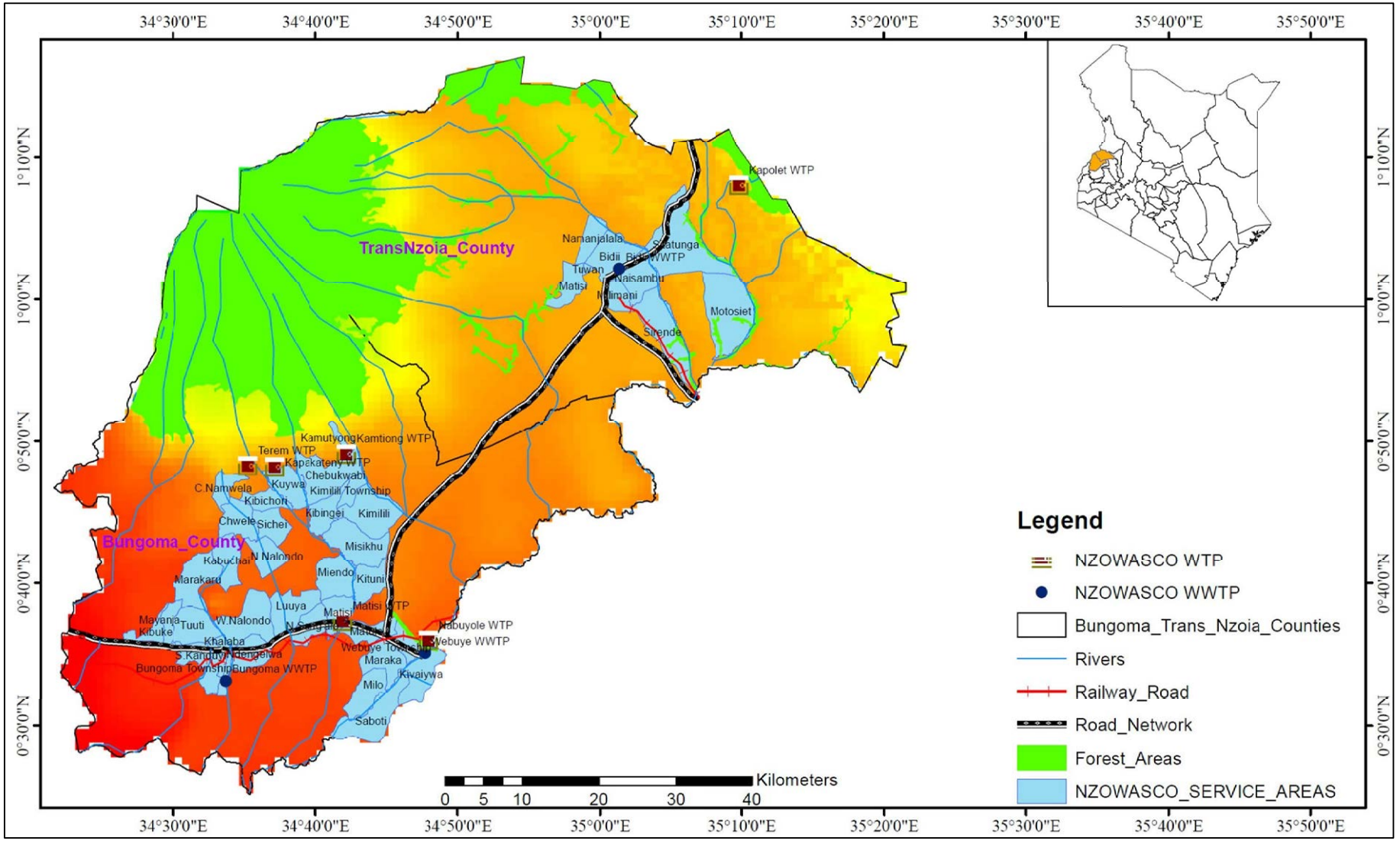
WTP	Location	Type	Year of Installation	Design Capacity	Current Capacity
Kapolet	Kitale	Conventional	2006	10,500	9,000
Nzoia	Kitale	Conventional	1982	10,500	3,000
Matisi	Bungoma	Conventional	2006	7,500	5,250
Nabuyole	Webuye	Conventional	2006	7,500	4,400
Terem	Chwele	Conventional	2018	2,500	2,000
Kapkateny	Chwele	Conventional	2014	5,000	3,500
Kimilili	Kimilili	Conventional	2004	5,000	1,600
Chesikaki	Chwele	Conventional	-	4,000	2,000

Source：NZOWASCO

Table 3 NZOWASCO Reservoirs

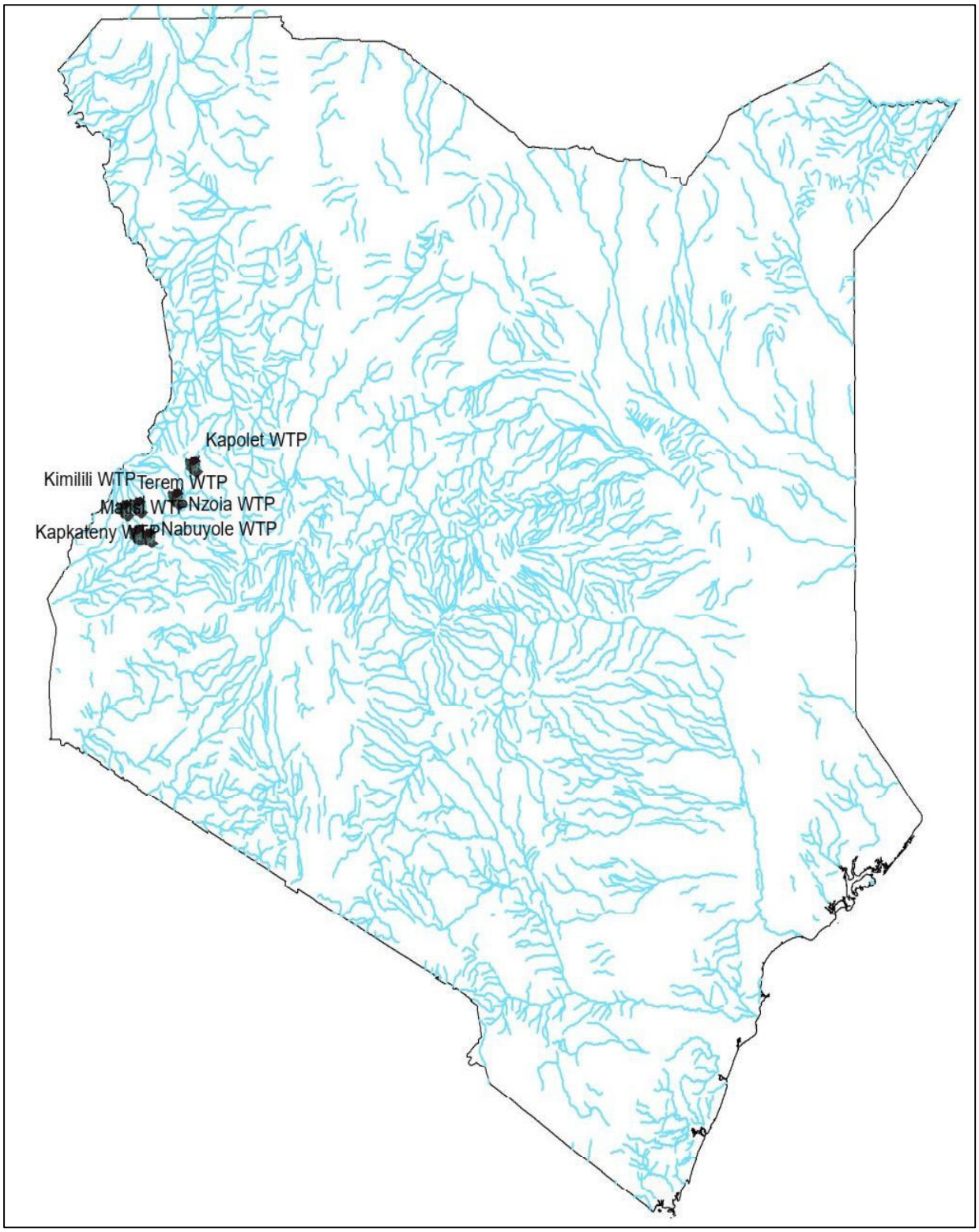
Reservoirs	Material	Year of Installation	Capacity (m^3)	In use
Mabanga Water Reservoir	Precast Concreate	1986 New tank 2010	-	-
Nabuyole Storage	Precast Concreate	1972 Renovated 2010	1,000 550 550	In use
Southern Compound Kitale storage Tanks	Elevated Steel. Precast Concrete	1984	1,500 1,135	In use
Northern Compound Kitale Storage Tanks	Elevated Steel Precast Concrete	1984	3,250 3,250	In use
Chwele Water Storage Tank	Masonry Ground	1986	225	In use
Total			**11,460**	

Source：NZOWASCO



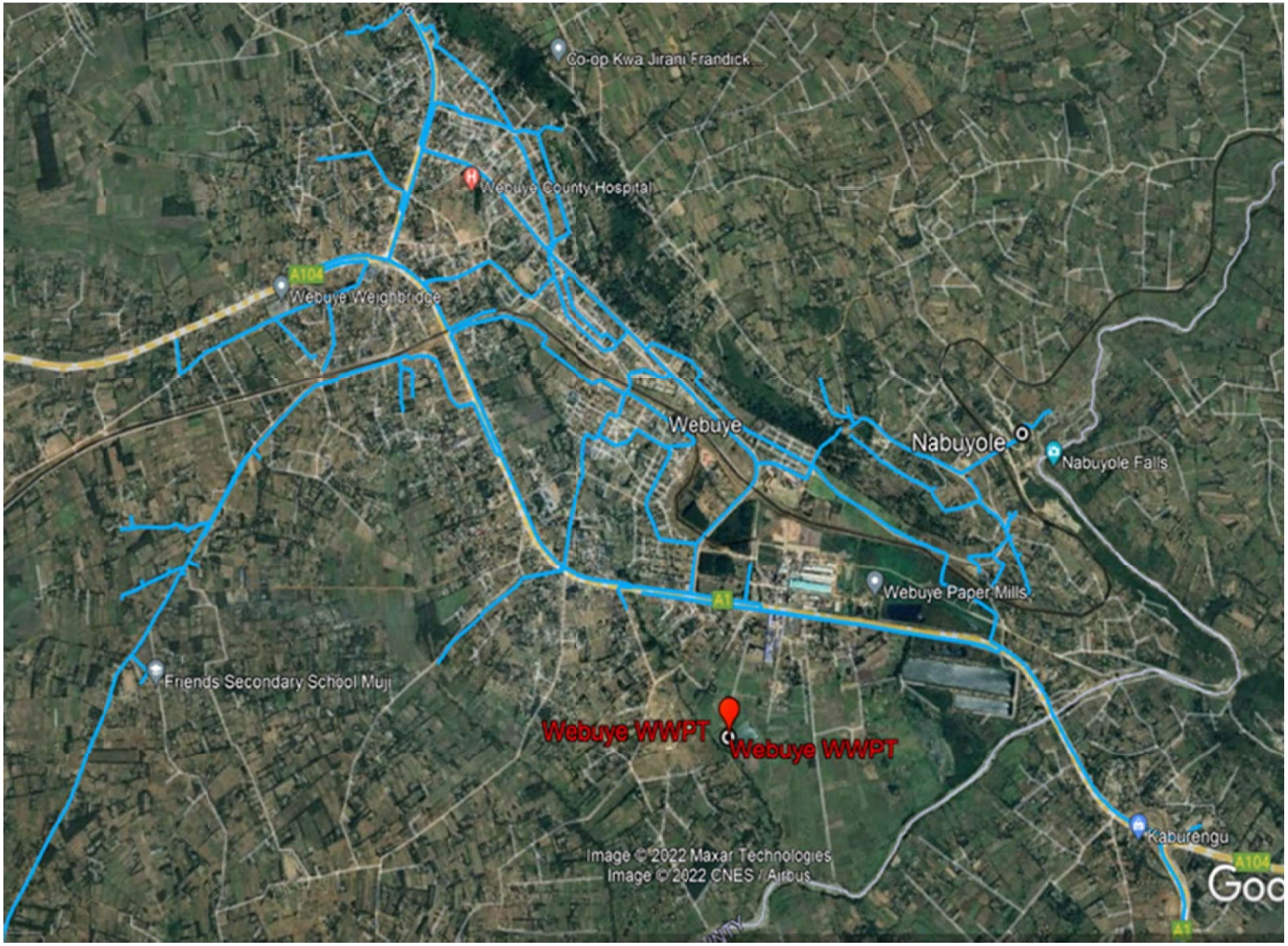
Source：NZOWASCO

Figure 1 NZOWASCO Service Area



Source：NZOWASCO

Figure 2 NZOWASCO WTP

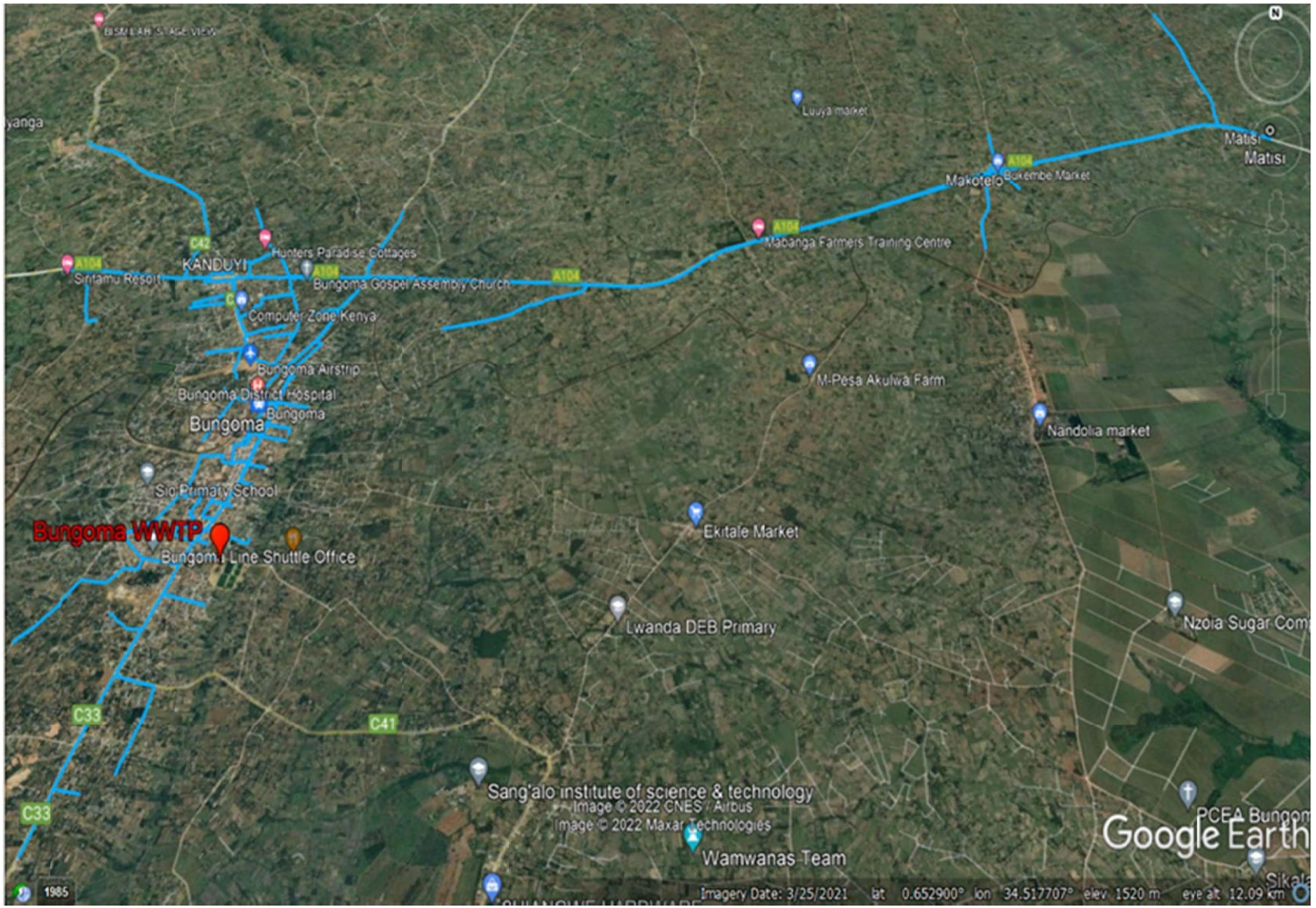


Source：NZOWASCO

Figure 3 Webuye Distribution Network

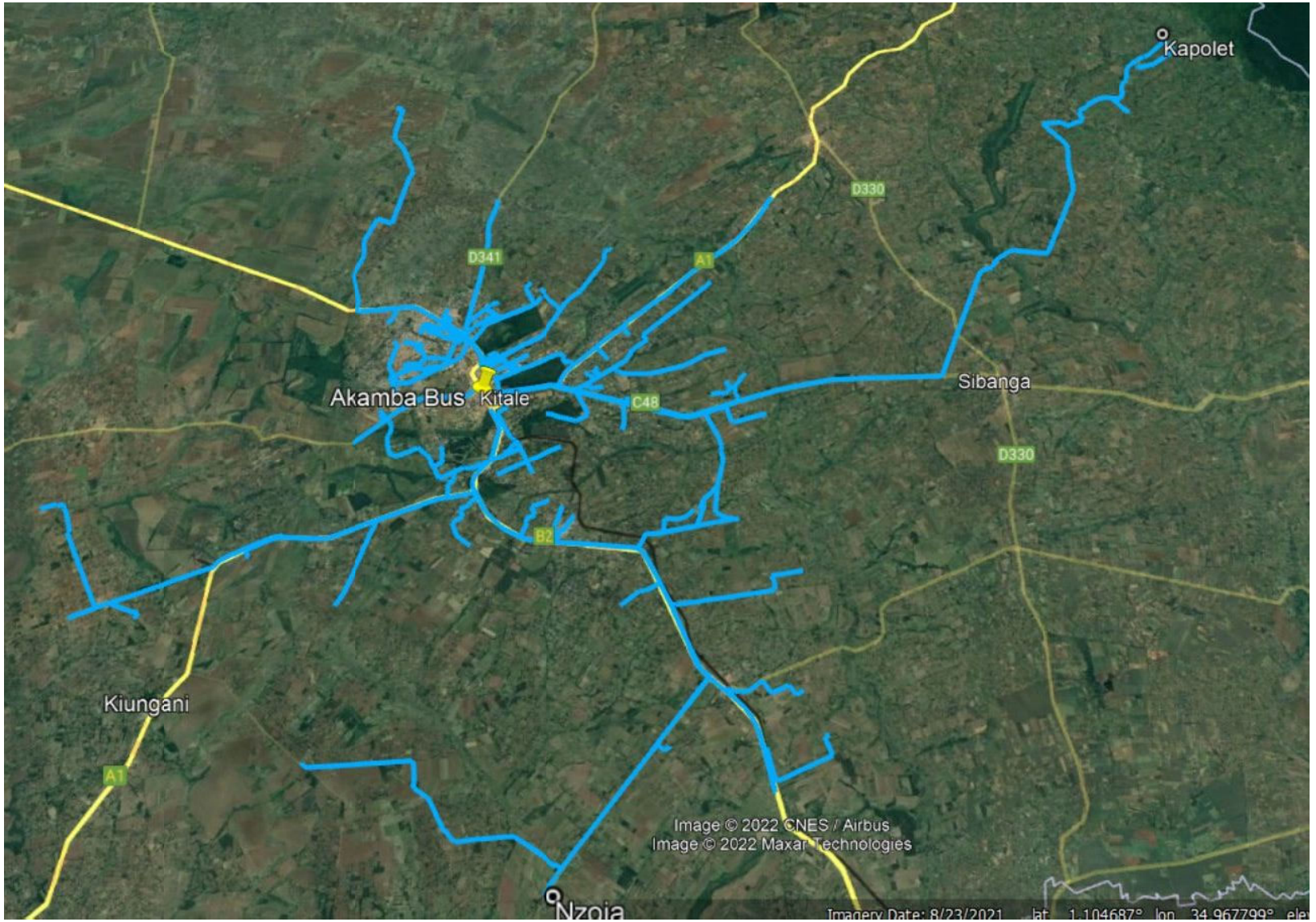
Source：NZOWASCO

Figure 4 Kimilili Distribution Network or DMA



Source：NZOWASCO

Figure 5 Bungoma Water Distribution Network



Source：NZOWASCO

Figure 6 Kitale Water Distribution Network

WSP-12

Isiolo WSP (IWASCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (IWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	No.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	• Last Mile Connectivity (extension of service lines for 9 km for water (63 mm – 110 mm HDPE), 12 km for sewer): MWSI (KES 73 million) • Drilling of one borehole equipped with solar panel, extension 4 km pipelines (110 m HDPE), rehabilitation of storage tank (50 m3) and boreholes: Catholic Relieve Services (Grant of KES 22 million) • Rehabilitation and solarized of boreholes, new system (ERP) being implemented, capacity building: Kenya Market Trust (Unknown) • During COVID-19, relieve activities being carried out such as solarized of 2 boreholes to increase service hours, and one borehole is drilled and equipped with solar panel, water treatment chemicals being purchased, Conditional Liquidity Support Grant (CLSG): WB through WSTF (KES 12 million)
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	【Strategic Plan 2019-2023】
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	Yes. Proposal for Grant Project (Urban Project Concept (UPC) Kiwanjani Project under WSTF, only pay VAT 16%)
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.

No.	Questions	Answers
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】
7	What is the reason for the inactive connections?	■ No payment □ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season □ Any other reason, if any please specify
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Water bills paid in installment • Enforcement of payment
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	12,000 m^3/day
10	Kindly provide the details for the water demand projection with calculation method and excel file.	2028: 20,649 m^3/day
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	□ Enough to develop the future demand □ Enough for current demand ■ Not enough ■ Need additional water sources (boreholes)
	2) Raw Water Quality	■ Meet the standard for drinking purpose (Turbidity of river water deteriorates to 2,000 NTU during rainy season. Some boreholes have high salinity) □ Meeting the standard but deteriorating
	3) Intake Facility Intake Volume	□ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand (3,000 m^3/d from river and boreholes during dry seasons, 6,000 m^3/d during rainy seasons)
	Facility Condition	□ Good ■ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	4) Raw Water Transmission System Transmission Volume	 □ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair (New WTP) ■ Deteriorating but can utilize (Old WTP) □ Need rehabilitation and augmentation
	5) Water Treatment Plant Treatment Volume	 □ Sufficient for future water demand ■ Sufficient for current demand □ Not sufficient for current demand
	Facility Condition	□ Good ■ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	 □ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure □ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	□ Using the saddle clamp with cock ■ Using the saddle clam (For big diameter pipe) ■ Using the tee (With valve for small diameter pipe)
	8) Water Meter	■ Using the piston type ■ Using propeller type Reason of selecting above: N/A

No.	Questions	Answers
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe □ Poor material use □ High pressure ■ Meter inaccuracy ■ Illegal connection □ Poor workmanship □ Others: Faulty meters (Failed to read the numbers)
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	□ By manual ■ By smart Phone □ By smart meter ■ Enterprise Resource Planning (ERP) □ JICS □ Other

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Isiolo River ② Boreholes		
2	Specifications of water source and intake facility	① Isiolo River	• Water source capacity: N/A m^3/day • Intake capacity: N/A m^3/hour, N/A m^3/day • Year Built: N/A • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		② Boreholes	• Water source capacity: Refer to Table 1. • Intake capacity: Refer to Table 1. • Year Built: N/A • Structure of intake facility (Elevation +N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	① Isiolo River ② Boreholes	• Maximum intake: N/A • Minimum intake: N/A • Permanent river or seasonal river: N/A	
4	Future development plan	N/A	N/A	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	N/A		
2	General information of water supply area / county	N/A	• Population / Beneficiaries: N/A • Household connections: N/A • Water Kiosk: N/A • Total / coverage area: N/A ㎢ • Average service hours: N/A • Water Treatment Plant: N/A • Main water source: N/A • Current domestic water demand: N/A • Future domestic water demand: N/A	

Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	① Isiolo WTP Phase I ② Isiolo WTP Phase II		
2	Specifications of WTP	① Isiolo WTP Phase I	• Type of treatment: N/A • Current treatment capacity: N/A m^3/day • Design treatment capacity: 3,000 m^3/day • Year Built: N/A • Structure of main facility: N/A	
		② Isiolo WTP Phase II	• Type of treatment: N/A • Current treatment capacity: N/A m3/day • Design treatment capacity: 4,500 m3/day • Year Built: N/A • Structure of main facility: N/A	
3	Water treatment conditions	① Isiolo WTP Phase I ② Isiolo WTP Phase II	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	① Isiolo WTP Phase I ② Isiolo WTP Phase II	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	

5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	N/A		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • NRW of main transmission line: N/A % • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	N/A		
2	Specifications of reservoir	N/A	• Current capacity: N/A • Year Built: N/A • Structure of main facility: ◆ Reservoir: N/A ◆ Distribution pump: N/A ◆ Water flow measurement facility: N/A ◆ Generator facility: N/A	
3	Operation and maintenance and Water quality test	N/A	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: N/A • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	
4	Future development plan	N/A	N/A	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	N/A		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • Distribution pump: N/A • NRW of main distribution line: N/A	
3	Future development plan	N/A	N/A	

Table 1 IWASCO Boreholes

Borehole	Location	Yield (m3/hr)	Yield (m3/d)	Status	Source Of Funding
Chief Camp	Kiwajani	7.8	93.6	Functional	
Uhuru Polytechnic	Uhuru	10	120	Functional	
Soko Borehole	Soko	14.2	170.4	Functional	
Wabera Primary	Wabera	13.9	166.8	Functional	
Kambi Odha	Kambi Odha	18.3	219.6	Functional	
DWO Office	DWO Office	10	120	Functional	
Ramadhan	Asharaf	7.8	93.6	Functional	
Kambi Garba Primary	Kambi Garba	20	240	Not functional	Donor (CRS)
Kambi ya Juu	Kambi Ya Juu	12	144	Not functional	Tariff
Bula Mpya	Bula Mpya	25.6	307.2	Not functional	Donor (CRS)
Police line	Police line	30	360	Not functional	Donor (CRS)
Phase 1	Phase 1	11	132	Not Functional	Tariff
Kiwanjani Primary	Kiwajani	13	156	Not Functional (Saline)	Donor (CRS)
Showground	Checheles	13.8	0	Not functional (Saline)	
Kisima Primary	Kisima	15	0	Not Functional	
Mwangaza Primay	Mwangaza	9	0	Not Functional (Saline)	
Total			2,323.2		

Source：IWASCO

WSP-13

Mombasa WSP (MOWASSCO)

Project for Strengthening Capacity of Water Service Providers on Formulating Bankable Project Plans

Questionnaire (MOWASCO)

No.	Questions	Answers
1	Are you willing to borrow the money from commercial bank when selected as target WSP?	Yes.
2	Kindly specify last 10 years project with major project comportment and amount, and source of fund for each project.	• Rehabilitation/Extension of Mombasa water supply network -Lot 1A(NMLD) under WaSSIP-AFD: KES 781,423,747.64 (WB) • Rehabilitation/Extension of Mombasa water supply network (KWS&CP): KES 404,375,960.86 (WB) • Rehabilitation/Extension of Mombasa water supply network- Nyali Phase 1. (NMLD - WSDP): KES 516,443,375.84 (WB) • Rehabilitation/Extension of Mombasa Water Supply Distribution Network-Lot 2B. (WSDP): KES 984,529,033.00 (WB) • Rehabilitation/Extension of Mombasa Water Supply Network – Committed: KES 1,585,395,349 (AfD).
3	Kindly provide the WSP long term plan with annual budget for O&M and investment for water supply system.	Noted.
4	Do you currently offer or intended to be offer any fund from doner, AOB, OBA, KPWF, own fund or any others? If yes, kindly provide the detail.	No.
5	Kindly provide the documents listed in Attachment 1 to 6 and Data Collection List.	Noted.
6	Kindly fill in the details for the overview of water supply facilities as shown in Attachment 1 to 6.	【Attachment 1 to 6】

No.	Questions	Answers
7	What is the reason for the inactive connections?	■ No payment ■ No water due to technical problem such as no pressure, blockages and so on □ There is any other alternative source. □ Deactivate the account during rainy season ■ Any other reason, if any please specify: Inadequate water supply
8	What kind of sensitization for the inactive connections to reconnection have been carried out?	• Door to door visits • Public meetings • Social media campaigns
9	Kindly provide the current total water demand (m^3/day) with calculation method and excel file.	214,877 m^3/day (ARTELIA / MIB Design Report)
10	Kindly provide the details for the water demand projection with calculation method and excel file.	2025: 245,144 m^3/day 2030: 278,735 m^3/day 2035: 317,534 m^3/day
11	Challenges Faced in the Water Supply Facilities 1) Potential of Water Source	□ Enough to develop the future demand □ Enough for current demand ■ Not enough ■ Need additional water sources
	2) Raw Water Quality	■ Meet the standard for drinking purpose □ Meeting the standard but deteriorating
	3) Intake Facility Intake Volume	□ Sufficient for future water demand □ Sufficient for current demand ■ Not sufficient for current demand
	Facility Condition	□ Good □ Fair ■ Deteriorating but can utilize □ Need rehabilitation and augmentation

No.	Questions	Answers
	4) Raw Water Transmission System Transmission Volume Facility Condition	 □ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand □ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	5) Water Treatment Plant Treatment Volume Facility Condition	 □ Sufficient for future water demand □ Sufficient for current demand □ Not sufficient for current demand □ Good □ Fair □ Deteriorating but can utilize □ Need rehabilitation and augmentation
	6) Water Distribution Systems Water Pressure	 □ Meeting the standards for water pressure ■ Not all area meeting the standards for water pressure □ Not meeting the standard when high demand □ Not meeting the standard
	7) Household Connection	■ Using the saddle clamp with cock □ Using the saddle clam ■ Using the tee
	8) Water Meter	□ Using the piston type ■ Using propeller type Reason of selecting above: Stalling/clogging of piston type

No.	Questions	Answers
	9) Non-Revenue Water (NRW) Reason and each percentage	■ Old pipe (Frequent bust on trunk mains due to aged pipelines. i.e. (Mzima North & South sections in West mainland)) ■ Poor material use (Customer lines are mostly done with poor materials) □ High pressure ■ Meter inaccuracy (Most of the Customer meters are dormant, Estimating and have outlived their useful life span) ■ Illegal connection (Due to low pressure, most customers are on disconnection, some has resulted to ground water tanks and the presence of spaghetti lines, this has provided a favorable condition for illegal water practices) ■ Poor workmanship (presence of spaghetti lines) ■ Others (Projects from other Government sectors, i.e. Roads, Power, Railway, telecom.)
	10) Billing System How do you read the water meter? What kind of software for billing system is using?	■ By manual ■ By smart Phone □ By smart meter □ Enterprise Resource Planning (ERP) □ JICS ■ Other: Edams (Outdated)

Attachment-1: Main Water Source

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of water source and intake facility	① Baricho Water Works Boreholes (Baricho Kilifi County) ② Mzima Springs (Taita Taveta County) ③ Marere Springs (Kwale County) ④ Tiwi Boreholes (Kwale County) Refer to Figure 1.		
2	Specifications of water source and intake facility	① Baricho Water Works Boreholes	• Water source capacity: 180,000 m^3/day • Intake capacity: 4.000 m^3/hour, 96,000 m^3/day • Year Built: 1980 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		② Mzima Springs	• Water source capacity: 294,000 m^3/day • Intake capacity: 1458.33 m^3/hour, 35,000 m^3/day • Year Built: 1957 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
		③ Marere Springs	• Water source capacity: 12,000 m^3/day • Intake capacity: 333.33 m^3/hour, 8,000 m^3/day • Year Built: 1923 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	

		④ Tiwi Boreholes	• Water source capacity: 15,000 m^3/day • Intake capacity: 333.33 m^3/hour, 8,000 m^3/day • Year Built: 1970 • Structure of intake facility (Elevation + N/A masl): ◆ Intake well: N/A ◆ Grit chamber: N/A ◆ Pump: N/A	
3	Outstanding annual and seasonal fluctuation / trend, if any	N/A	• Maximum intake: N/A • Minimum intake: N/A • Permanent river or seasonal river: N/A	
4	Future development plan	① Mwache Dam-Kwale County	• Intake capacity: 186,000 m^3/day (ongoing) • Scheduled: 2022-2027 • Purpose: To boost the water supply within Mombasa town	
		② Pemba Dam-Kwale County	• Intake capacity: 3000 m^3/day (New-ongoing) • Scheduled year: 2022-2023 Purpose: To boost the water supply within (Mombasa County - west mainland)	

Attachment-2: Management Structure and Area of Coverage

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location of water supply area / county	① Island ② North Mainland (Kisauni, Nyali) ③ West Mainland ④ South Mainland 		
2	General information of water supply area / county	① Island	• Population / Beneficiaries (2020): 154,171 • Household connections (2022): 25,081 • Water Kiosk: 156 • Total / coverage area: (2022): 25.85 /30.41 km² • Average service hours (2020): 6 hours • Main water source: Mzima, Marere Springs & Baricho Boreholes • Current domestic water demand: 11,318,760 m³/yr, 31,441 m³/day • Future domestic water demand: 14,030,640 m³/yr, 38,974 m³/day	

		② North Mainland (Kisauni, Nyali)	• Population / Beneficiaries (2020): 508,507 • Household connections (2022): 39,007 • Water Kiosk: 932 • Total / coverage area: (2022): 68.51 / 119.71 km^2 • Average service hours (2020): 6 hours • Main water source: Baricho Boreholes • Current domestic water demand: 27,257,760 m^3/yr, 75,716 m^3/day • Future domestic water demand: 46,067,400 m^3/yr, 127,965 m^3/day	
		③ West Mainland	• Population / Beneficiaries (2020): 295,297 • Household connections (2022): 16,293 • Water Kiosk: 797 • Total / coverage area: (2022): 25.69 /42.81 km^2 • Average service hours (2020): 6 hours • Main water source: Mzima & Marere Springs • Current domestic water demand: 19,359,720 m^3/yr, 53,777 m^3/day • Future domestic water demand: 29,763,000 m^3/yr, 82,675 m^3/day	
		④ South Mainland	• Population / Beneficiaries (2020): 250,358 • Household connections (2022): 3,568 • Water Kiosk: 134 • Total / coverage area: (2022): 7 / 30.42 km^2 • Average service hours (2020): 6 hours • Main water source: Tiwi & Marere Springs • Current domestic water demand: 12,155,400 m^3/yr, 33,765 m^3/day • Future domestic water demand: 24,451,560 m^3/yr, 67,921 m^3/day	

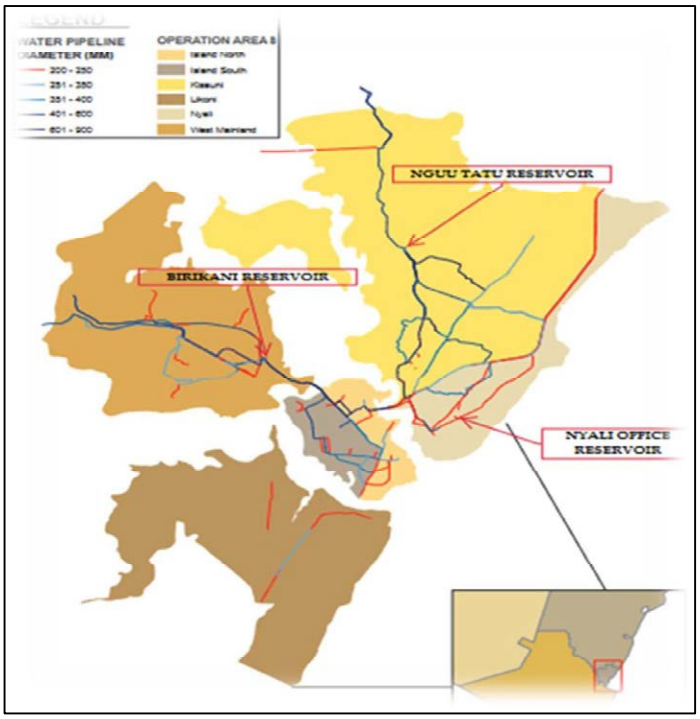
Attachment-3: Water Treatment Plant (WTP)

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of WTP	Receive treated water from CWWDA.		
2	Specifications of WTP	N/A	• Type of treatment: N/A • Current treatment capacity: N/A m^3/day • Design treatment capacity: N/A m^3/day • Year Built: N/A • Structure of main facility: N/A	
3	Water treatment conditions	N/A	• Utilization of plant capacity: N/A % • Hours for WTP Utilization: N/A • Flow diagram of the water treatment process: N/A • Type and amount of chemicals used during the process for during the dry and rainy seasons: ◆ PAC: N/A kg/day ◆ Sodium hypochlorite: N/A kg/day ◆ Concentrated sulfuric acid: N/A kg/day ◆ Lime: N/A kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor cost: N/A ◆ Chemical cost: N/A ◆ Electricity cost: N/A ◆ Maintenance cost: N/A ◆ Other cost: N/A	
4	Water quality test	N/A	• Main items to be tested in each process and frequency of the test (raw water, after treatment and so on): N/A • Compliance with water quality standards: N/A	
5	Future development plan	N/A	N/A	

Attachment-4: Water Transmission Mains to Reservoir

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of transmission pipeline	Managed by CWWDA		
2	Specifications of Pipeline	N/A	• Location, materials, diameter and length of each pipeline: N/A • Year Built: for each pipeline: N/A • NRW of main transmission line: N/A % • Transmission pump: N/A	
3	Future development plan	N/A	N/A	

Attachment-5: Reservoirs

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of Reservoir	① Nguu Tatu Reservoir ② Changamwe / Birikani Reservoirs ③ Nyali Reservoir 		
2	Specifications of reservoir	① Nguu Tatu Reservoir	• Current capacity (2020): 27,000 m^3/day ◆ Tank 1: 4,500 m^3/day ◆ Tank 2: 4,500 m^3/day ◆ Tank 3: 18,000m^3/day ◆ Material: RC • Year Built: March, 1980 • Structure of main facility: ◆ Reservoir: Type: ground Material: RC ◆ Distribution: type by Gravity ◆ Water flow measurement facility: Inlet type of water meter: Electromagnetic and size DN 400mm.	

		② Changamwe / Birikani Reservoirs	• Current capacity (2020): 26,000 m^3/day • Tank 1: 3,000 m^3/day • Tank 2: 3,100 m^3/day • Tank 3: 2,500 m^3/day • Tank 4: 3,500 m^3/day • Tank 5: 4,200 m^3/day • Tank 6: 9,700 m^3/day • Year Built: March, 1957 • Structure of main facility: ◆ Reservoir: Type: Under ground Material: RC ◆ Distribution: type by Gravity ◆ Water flow measurement facility: Outlet & inlet has no working meters, meter: inlet DN 500 Steel Marere line, DN 575 Concrete Mzima North and Mzima South , Outlets fitted with DN 600mm & DN900 Electromagnetic Meters but not working.	
3	Operation and maintenance and Water quality test	① Nguu Tatu Reservoir	• Flow diagram of reservoir: N/A • Type and amount of chemicals used before distribution if any: N/A ◆ Sodium hypochlorite: 45 kg/day • Annual Operation and maintenance cost and its breakdown: N/A ◆ Labor / maintenance cost: N/A ◆ Electricity cost: N/A ◆ Other cost: N/A • Main items to be tested in reservoir: N/A • Compliance with water quality standards: N/A	

4	Future development plan	① West mainland reservoir	• Design capacity / specification: 14,000 m^3/day • Scheduled year: 2027 • Purpose: retaining 14,000 m^3 to boost the service hour from 6 to 16 within town to meet the demand in West Mainland area. Refer to Source：MOWASCO Figure 2.	
		② New Nguuni Reservoir constructed in Nguu Tatu	• Treatment capacity: 14,000 m^3/day (New) • Scheduled year: 2022～2027 • Purpose: To increase coverage of the drinking water to underserved and un-served areas (Kisauni & Nyali Sub County) (North Mainland)	
		③ New Changamwe Reservoir constructed in Nguu Tatu	• Treatment capacity: 14,000 m^3/day (New) • Scheduled year: 2022～2027 • Purpose: To increase coverage of the drinking water to underserved and un-served areas (Island area of Mombasa County.)	
		④ Dongo kundu Reservoir	• Treatment capacity: 28,000 m^3/day (New) • Scheduled year: 2022～2027 • Purpose: To increase coverage of the drinking water to underserved and un-served areas (South Mainland Area of Mombasa County.)	

Attachment-6: Water Distribution Mains

No.	Items	Details / Numbers / Specifications / Conditions		Note
1	Name and location map of distribution pipeline network	① Kisauni Business Unit distribution network or DMA ② Nyali Business Unit distribution network or DMA ③ Island Business Unit distribution network or DMA ④ West Mainland Business Unit distribution network or DMA ⑤ South Mainland/Likoni Business Unit distribution network or DMA. Refer to Source：MOWASCO Figure 3.		
2	Specifications of Pipeline	① Kisauni Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 1. • Year Built: for each pipeline 1980 (with some ongoing network upgrading) • Distribution is by Gravity from Nguu Tatu reservoirs • NRW of main distribution line: 49% (2020), 50% (2021), 50% (2022)	
		② Nyali Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 2. • Year Built: for each pipeline 1980 (with some ongoing network upgrading) • Distribution is by Gravity from Nguu Tatu reservoirs • NRW of main distribution line: 49% (2020), 50% (2021), 50% (2022)	

		③ Island Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 3. • Year Built: for each pipeline 1923 (with minor network upgrading) • Distribution is by Gravity from Nguu Tatu & Changamwe reservoirs • NRW of main distribution line: 22% (2020), 38% (2021), 15% (2022)	
		④ West Mainland Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 4. • Year Built: for each pipeline 1923, 1957 and 2020. • Distribution is by Gravity from Mazeras reservoirs • NRW of main distribution line: Last 5 years NRW 2020-62%, 2021-61%, 2022-60%	
		⑤ South Mainland/Likoni Business Unit Lines	• Location, materials, diameter and length of each pipeline: Refer to Table 5. • Year Built: for Marere pipeline 1923, Tiwi piplines with south mainland in 1980, upgraded in 2020. • Distribution is by Gravity from Kayabombo Reservoirs • NRW of main distribution line: 62% (2020), 36% (2021), 37% (2022)	

<table>
<tr>
<td>3</td>
<td>Future development plan</td>
<td>① Rehabilitation/Expansion of Mombasa water supply distribution Network.-Lot 1B Island Mombasa county</td>
<td>
<table>
<tr><td>LOCATION</td><td>Island</td></tr>
<tr><td>MATERIAL</td><td>Steel, HDPE</td></tr>
<tr><td>LENGTH</td><td>94.59 km</td></tr>
<tr><td>SCHEDULED YEAR</td><td>2022 - 2027</td></tr>
<tr><td>PURPOSE</td><td>Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 38,974 m^3/day</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>② Rehabilitation / Expansion of Mombasa Water Supply Network -Lot 2C Island Mombasa county</td>
<td>
<table>
<tr><td>LOCATION</td><td>Island</td></tr>
<tr><td>MATERIAL</td><td>Steel, HDPE</td></tr>
<tr><td>LENGTH</td><td>40 km</td></tr>
<tr><td>SCHEDULED YEAR</td><td>2022 - 2027</td></tr>
<tr><td>PURPOSE</td><td>Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 38,974 m^3/day</td></tr>
<tr><td>Population</td><td>154,171 (census 2019)</td></tr>
</table>
</td>
<td></td>
</tr>
</table>

		③ Rehabilitation/Expansion of Mombasa Water Supply Distribution Network. North Mainland Mombasa County	<table><tr><td>LOCATION</td><td>North Mainland</td></tr><tr><td>MATERIAL</td><td>Steel, HDPE</td></tr><tr><td>LENGTH</td><td>39.94 km</td></tr><tr><td>SCHEDULED YEAR</td><td>2022 - 2027</td></tr><tr><td>PURPOSE</td><td>Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 127,965 m^3/day</td></tr><tr><td>Population</td><td>508,507 (census 2019)</td></tr></table>	

		④ Rehabilitation/Extension of Mombasa Water supply distribution Network. South Mainland Mombasa County	LOCATION	North Mainland	
			MATERIAL	Steel, HDPE	
			LENGTH	39.94 km	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Reduces Physical NRW. Reduce O&M cost. Increase absorption capacity and access to water to meet the demand 67,921 m^3/day	
			Population	250,328 (census 2019)	
		⑤ 76 DMA Formation to cover the whole of the service area	LOCATION	North Mainland	
			MATERIAL	Steel, HDPE	
			LENGTH	As shall be to the design	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Create 33 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter accuracy	

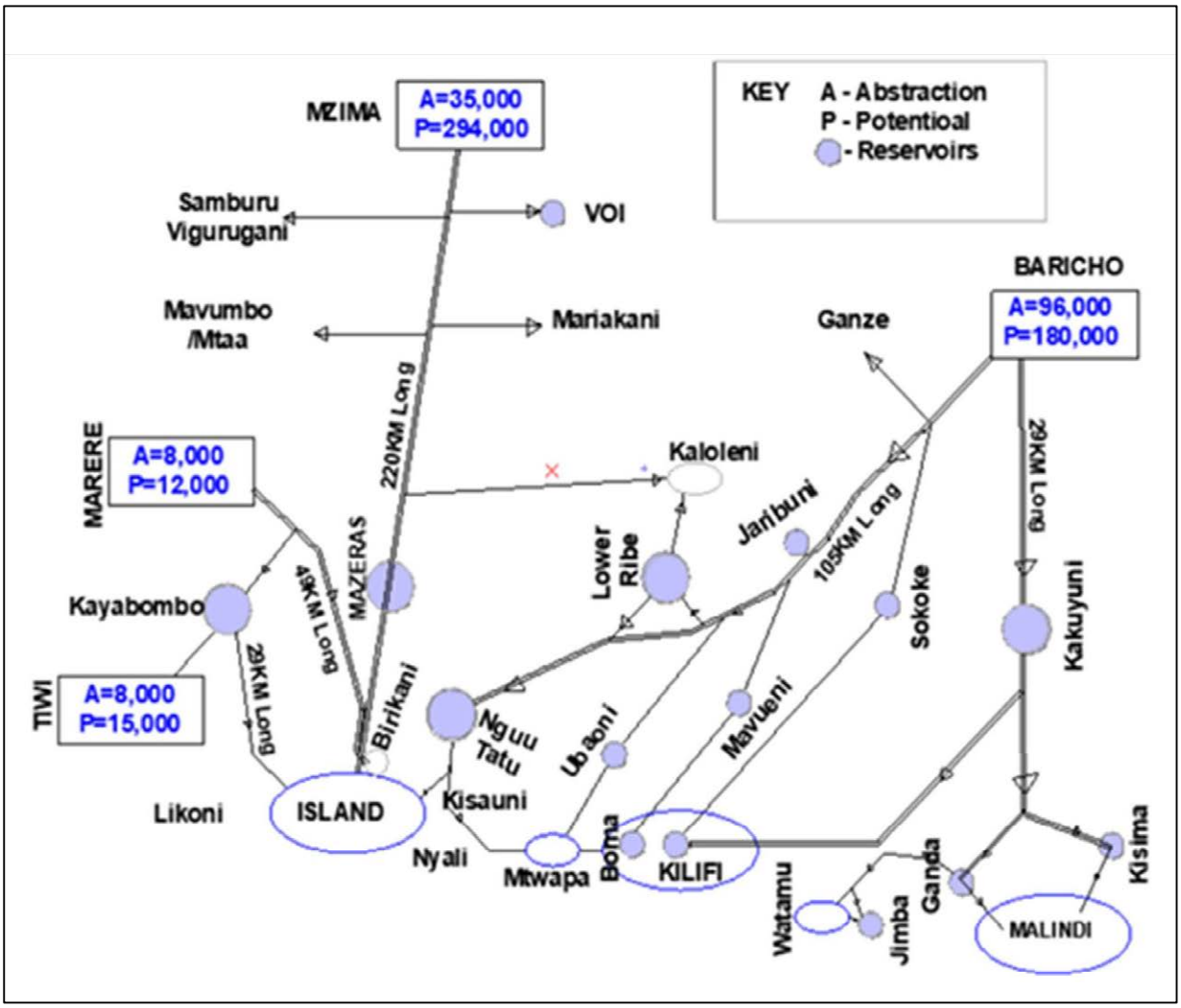
					survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping.	
				Proposed DMAs	33	
				Population	250,328 (census 2019)	
				Household Connections	39,007	
				New Meters	40,000 considering increase in new connection due to Mwache	

		⑥ 76 DMA Formation to cover the whole of the service area	LOCATION	Island	
			MATERIAL	Steel, HDPE	
			LENGTH	As shall be to the design	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Create 11 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter accuracy survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping.	
			Proposed	11	

			DMAs		
			Population	154,171 (census 2019)	
			Household Connections	25051	
			New Meters	25,000 considering increase in new connection due to Mwache	
		⑦ 76 DMA Formation to cover the whole of the service area	LOCATION	West Mainland	
			MATERIAL	Steel, HDPE	
			LENGTH	As shall be to the design	
			SCHEDULED YEAR	2022 - 2027	
			PURPOSE	Create 11 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter accuracy survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and	

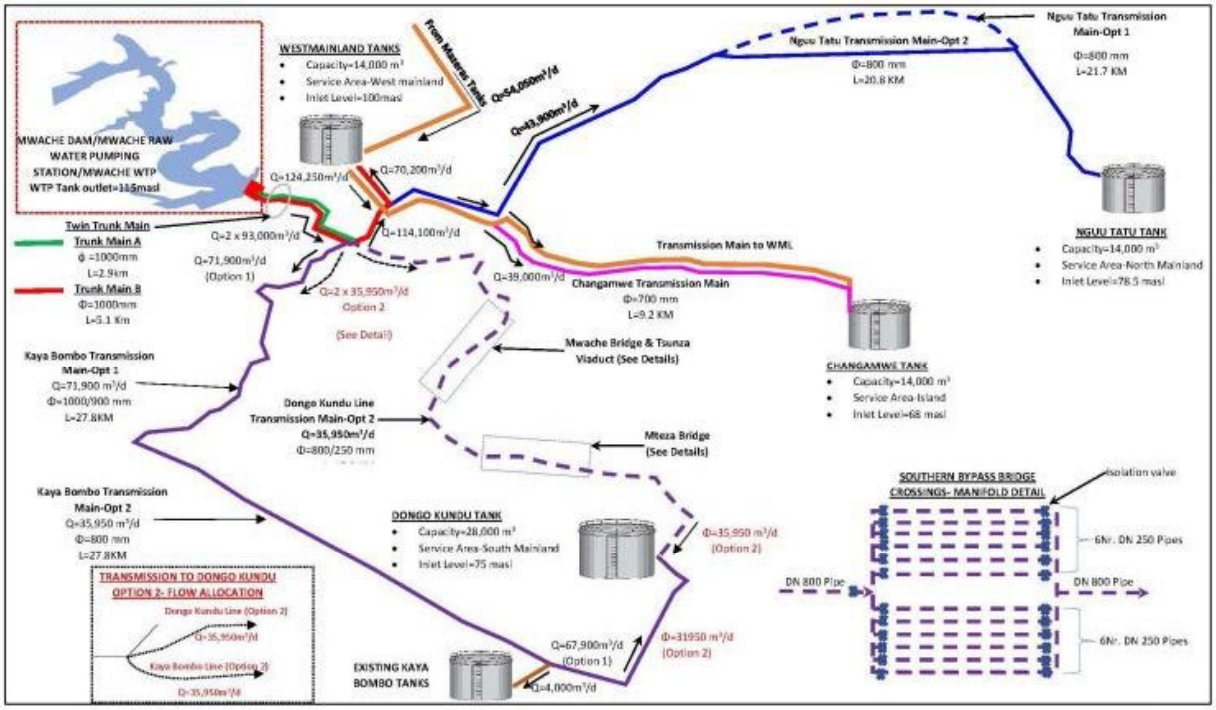
					removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping.
				Proposed DMAs	17
				Population	295,297 (census 2019)
				Household Connections	16,293
				New Meters	20,000 considering increase in new connection due to Mwache
		⑧ 76 DMA Formation to cover the whole of the service area.		LOCATION	South Mainland
				MATERIAL	Steel, HDPE
				LENGTH	As shall be to the design
				SCHEDULED YEAR	2022-2027
				PURPOSE	Create 13 DMAs, Isolation of Water Storage Tanks, Customer Meter Survey and database upgrading, customer meter

					accuracy survey, replacing reactivation, and installing of new connections, design of DMAs, restructuring network and removal of spaghetti lines, staff needs assessment, relocation of duties to align with the NRW Procedures and training and equipping. Pressure management	
				Proposed DMAs	13	
				Population	250,393 (census 2019)	
				Household Connections	3,568	
				New Meters	15,000 considering increase in new connection due to Mwache	



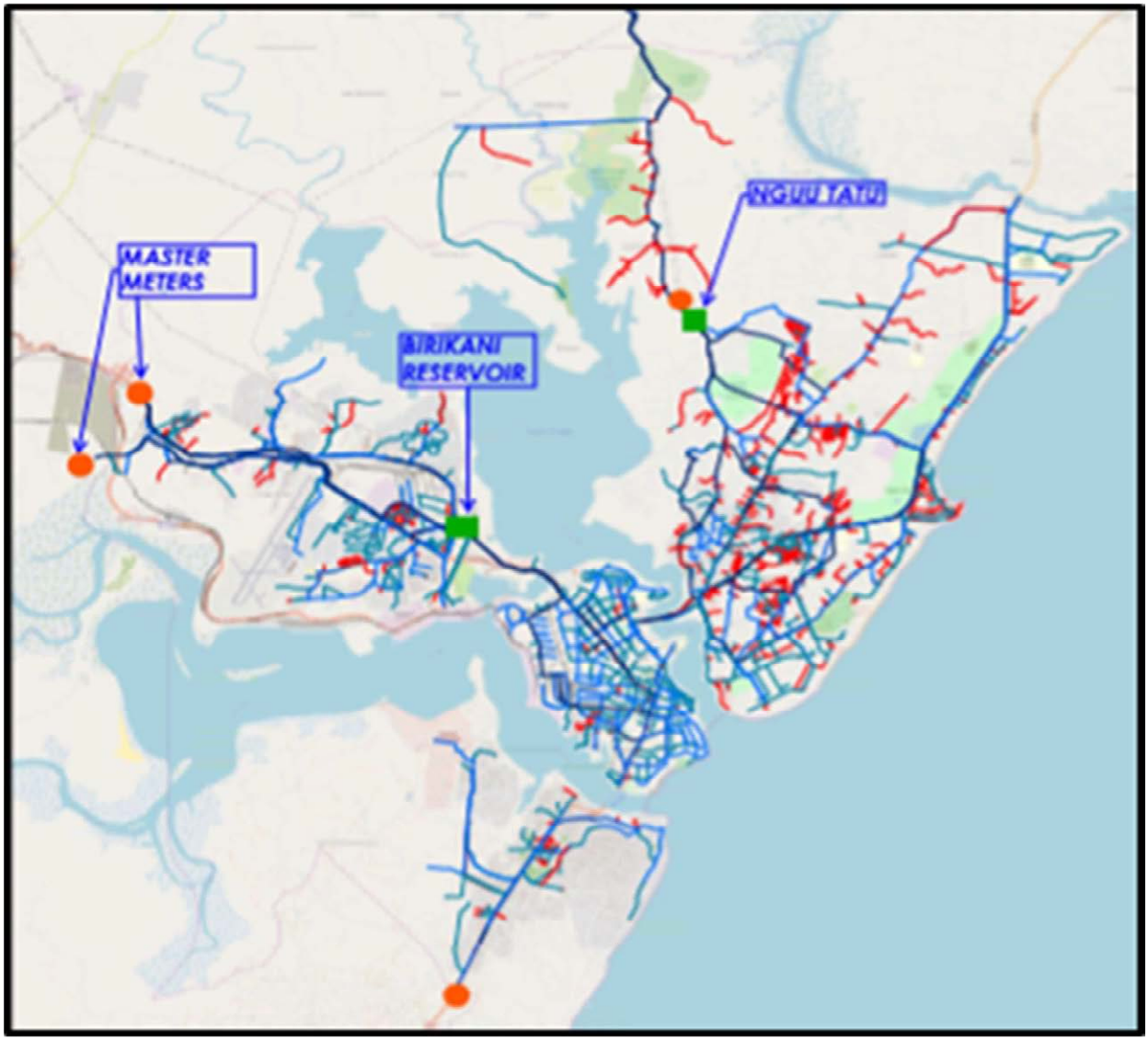
Source：MOWASCO

Figure 1 MOWASCO Water Source



Source：MOWASCO

Figure 2 West Mainland Reservoir



Source：MOWASCO

Figure 3 MOWASCO Water Distribution Networks

Table 1 Kisauni Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	3077.143	0.000	0.000	0.000	0.000	1253.199	0.000	0.000	0.000	4330.342	2.175
800	0.000	46.952	0.000	0.000	0.000	0.000	3899.890	0.000	0.000	3946.841	1.982
700	0.000	4042.931	0.000	0.000	0.000	0.000	4175.077	0.000	0.000	8218.008	4.127
600	8310.641	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8310.641	4.173
550	0.000	0.000	0.000	0.000	0.000	0.000	40.645	0.000	0.000	40.645	0.020
525	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
500	0.000	2393.056	0.000	0.000	0.000	3759.525	3525.954	0.000	0.000	9678.535	4.860
400	0.000	3601.527	0.000	3655.016	0.000	0.000	127.584	0.000	0.000	7384.128	3.708
375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
350	0.000	0.000	0.000	205.265	0.000	0.000	0.000	0.000	0.000	205.265	0.103
315	0.000	0.000	0.000	7929.304	0.000	0.000	0.000	0.000	0.000	7929.304	3.982
300	0.000	2937.643	0.000	225.118	0.000	0.000	0.000	3364.150	0.000	6526.911	3.278
250	0.000	34.083	0.000	0.000	0.000	9.942	87.508	3959.752	0.000	4091.286	2.055
200	0.000	26.565	0.000	1746.875	0.000	0.000	0.000	0.000	0.000	1773.440	0.891
170	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
160	0.000	0.000	0.000	10694.179	0.000	0.000	0.000	0.000	0.000	10694.179	5.370
150	0.000	301.552	0.000	3514.562	0.000	0.000	2.220	865.422	0.000	4683.755	2.352
125	0.000	1539.710	0.000	471.501	0.000	0.000	0.000	0.000	0.000	2011.211	1.010
110	0.000	0.000	3198.107	9103.914	0.000	0.000	0.000	0.000	0.000	12302.021	6.178
100	0.000	2608.782	245.048	18.822	0.000	141.175	0.000	8054.351	0.000	11068.178	5.558
< 100	0.000	15537.322	22914.272	42896.893	14155.229	0.000	0.000	430.448	0.000	95934.164	48.177
GRAND TOTALS	11387.783	33070.123	26357.427	80461.448	14155.229	5163.842	11858.878	16674.123	0.000	199128.853	

Source：MOWASCO

Table 2 Nyali Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	""	""	""	""	""	""	""	""	""	0	0
800	""	""	""	""	""	""	""	""	""	0	0
700	""	""	""	""	""	""	""	""	""	0	0
600	""	""	""	""	""	""	""	""	""	0	0
550	""	""	""	""	""	""	""	""	""	0	0
525	""	""	""	""	""	""	""	""	""	0	0
500	""	2204.013	""	""	""	""	""	""	""	2204.0127	1.461692102
400	""	3549.105	""	""	""	""	""	""	""	3549.1046	2.353751535
375	""	""	""	""	""	""	""	""	""	0	0
350	""	""	""	6199.471	""	""	""	2.970054	""	6202.4415	4.113433598
315	""	""	""	""	""	""	""	""	""	0	0
300	""	""	""	21.04692	""	""	""	38.2795	""	59.326418	0.039345035
250	""	14.11959	""	4923.819	""	""	""	8019.556	""	12957.494	8.593356451
200	""	""	""	13399.14	""	""	""	6717.97	""	20117.111	13.34158524
170	""	""	""	""	""	""	""	""	""	0	0
160	""	""	""	""	""	""	""	""	""	0	0
150	""	4315.615	""	6233.899	""	""	""	2595.853	""	13145.367	8.717953392
125	""	""	""	""	""	""	""	""	""	0	0
110	""	""	3485.99	6652.737	""	""	""	""	""	10138.727	6.723961842
100	""	7483.186	""	""	""	13.1159	15.12	16069.87	""	23581.291	15.63901456
< 100	""	21418.87	19930.98	9448.248	611.26	0	0	6996.347	424.432018	58830.14	39.01590625
GRAND TOTALS	0	38984.91	23416.97	46878.36	611.26	13.1159	15.12	40440.84	424.432018	150785.02	

Source：MOWASCO

Table 3 Island Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	-	-	-	-	-	1507.533	-	-	-	1507.533	1.238
800	-	-	-	-	-	-	-	-	-	0.000	0.000
700	-	-	-	-	-	2858.093	-	-	-	2858.093	2.346
600	-	-	-	-	-	4190.675	-	-	-	4190.675	3.440
550	-	-	-	-	-	-	-	-	-	0.000	0.000
525	-	-	-	-	-	-	-	-	-	0.000	0.000
500	-	-	-	-	-	497.579	-	-	-	497.579	0.408
400	-	-	-	-	-	3222.502	-	-	-	3222.502	2.646
375	-	-	-	-	-	5091.695	-	-	-	5091.695	4.180
350	-	-	-	-	-	-	-	-	-	0.000	0.000
315	-	-	-	-	-	-	-	-	-	0.000	0.000
300	-	245.266	-	-	-	1653.274	-	1615.905	-	3514.445	2.885
250	-	-	-	-	-	-	-	-	-	0.000	0.000
200	458.900	216.739	-	-	-	1156.910	317.049	7846.481	-	10006.080	8.214
170	-	-	-	-	-	-	-	-	-	0.000	0.000
160	-	-	-	587.738	-	-	-	-	-	587.738	0.483
150	-	1908.449	-	7258.273	-	183.167	5558.836	25515.761	-	40424.486	33.186
125	-	-	-	-	-	-	-	-	-	0.000	0.000
110	-	-	-	-	-	-	-	-	-	0.000	0.000
100	-	7251.196	-	479.178	-	-	853.064	13507.994	-	22091.431	18.136
<100	-	6842.238	2486.664	725.797	-	-	-	17763.577	-	27818.276	22.837
GRAND TOTALS	458.900	16463.888	2486.664	9050.986	0.000	20361.428	6728.948	86249.718	0.000	121810.533	

Source：MOWASCO

Table 4 West Mainland Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	**	**	**	**	**	3867.127	**	**	**	3867.127	2.155
800	**	**	**	**	**	**	**	**	**	0.000	0.000
700	**	**	**	**	**	**	**	**	**	0.000	0.000
600	1726.182	**	**	**	**	345.616	**	**	0.442	2072.240	1.155
550	**	**	**	**	**	**	**	**	**	0.000	0.000
525	**	**	**	**	**	**	**	**	16905.676	16905.676	9.420
500	173.964	**	**	**	**	9324.926	**	**	**	9498.889	5.293
400	**	**	**	3981.614	**	0.123	**	**	**	3981.737	2.219
375	**	**	**	**	**	**	**	**	**	0.000	0.000
350	909.287	**	**	**	**	3685.834	**	**	**	4595.121	2.560
315	**	**	**	**	**	**	**	**	**	0.000	0.000
300	12050.450	**	**	3585.892	**	**	**	**	**	15636.342	8.712
250	**	625.092	**	607.324	**	**	**	983.052	**	2215.468	1.234
200	**	15.956	**	6745.086	**	793.491	**	4165.286	**	11719.818	6.530
170	**	**	**	**	**	**	**	**	**	0.000	0.000
160	**	**	**	**	**	**	**	**	**	0.000	0.000
150	**	2160.952	1230.759	11996.837	**	2398.741	**	17828.173	**	35615.461	19.845
125	**	**	**	**	**	**	**	**	**	0.000	0.000
110	**	**	271.983	**	**	**	**	**	**	271.983	0.152
100	**	6515.104	1844.938	21513.767	14.744	**	**	8293.701	**	38182.254	21.275
< 100	**	12639.353	6698.309	13059.371	2436.141	**	**	75.967	**	34809.142	19.451
GRAND TOTALS	14859.883	21956.457	10045.989	61489.890	2450.885	20415.858	0.000	31346.179	16906.118	179471.258	

Source：MOWASCO

Table 5 West Mainland Business Unit Lines

DIAMETER	DI	GI	HDPE	PVC	PPR	STEEL	CI	AC	CONCRETE	TOTAL	SHARE (%)
900	"	"	"	"	"	"	"	"	"	0.000	0.000
800	"	"	"	"	"	"	"	"	"	0.000	0.000
700	"	"	"	"	"	"	"	"	"	0.000	0.000
600	"	"	"	"	"	"	"	"	"	0.000	0.000
550	"	"	"	"	"	"	"	"	"	0.000	0.000
525	"	"	"	"	"	"	"	"	"	0.000	0.000
500	"	"	"	"	"	"	"	"	"	0.000	0.000
400	"	"	"	"	"	"	"	"	"	0.000	0.000
375	"	"	"	"	"	"	"	"	"	0.000	0.000
350	"	"	"	"	"	2474.406	"	"	"	2474.406	5.359
315	"	"	"	"	"	"	"	"	"	0.000	0.000
300	"	"	"	"	"	"	"	"	"	0.000	0.000
250	"	"	"	"	"	"	"	"	"	0.000	0.000
200	"	2079.072	"	1801.146	"	"	285.288	2022.412	"	6187.918	13.402
170	"	1.527	"	"	"	"	"	"	"	1.527	0.003
160	"	"	"	"	"	"	"	"	"	0.000	0.000
150	"	2448.592	458.850	4145.887	"	"	"	5636.666	"	12689.995	27.483
125	"	"	"	"	"	"	"	"	"	0.000	0.000
110	"	"	"	"	"	"	"	"	"	0.000	0.000
100	"	3666.331	"	3034.191	"	"	"	1199.751	"	7900.273	17.110
< 100	"	4795.908	5766.872	5313.045	"	"	"	1043.314	"	16919.139	36.643
GRAND TOTALS	0.000	12991.430	6225.722	14294.270	0.000	2474.406	285.288	9902.143	0.000	46173.258	

Source：MOWASCO

参考資料 - 5
ケニア国戦略計画における
13 WSPs のプロジェクト

(1)　Embu WSP

表 2.1　EWASCO の水道施設への投資予算（中期計画案：2021-2025）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	浄水量を 30,000 から 55,000 m^3/日への増量、配水管の拡張	Kanyuambora WTP のための用地の確保、詳細設計のレビューおよび工事資金の外部からの調達	2021-2022	15.5
		Kanyuambora WTP の建設	2022-2025	900
		Kanyuambora スキームのための配水池二カ所の建設（1,200 m^3 と 3,000 m^3）	2022-2023	75
		Kanyuambora スキームのため導水管（10 km）・送水管（15 km）・配水管（160 km）	2022-2024	474
		Nukangu WTP の拡張、取水堰および導水管の改善のための工事	2022-2023	250
		Thiba 川からの取水施設と浄水施設の建設	2023-2024	250
2	新たに 30,000 顧客への給水	1,000 m^3 の配水池 5 カ所の建設	2021-2023	125
		送配水管の建設（25 km）		75
		配水管の拡張（80 km）	2021-2025	240
		給水管（30,000 戸）の敷設	2021-2025	300
3	無収水率 43%から 20%へ低減	既存配水管（50 km）の敷設替え	2021-2025	176
		配管の移設（16 km）	2021-2022	166
		機械式顧客メーターの改善	2021-2025	56
		スマートメーターの導入	2021-2025	15
		無収水ユニットの強化（年次計画の作成、機材の購入、トレーニング、四半期レビュー等を含む）	2021-2025	46
4	収益に占める運転費の割合を 93%から 80%へ削減	ICT の強化（ERP の導入と既存請求システムとの統合を含む）	2021-2025	27
		ISO 等の品質管理についての認証の取得	2021-2023	23
5	顧客満足度を 74%から 85%への向上	顧客サービス憲章の見直しと実施、顧客とのコミュニケーションや啓発の改善、顧客との関係改善のためのマネージメント等	2021-2025	45
6	収入を KSH 432 mil から KSH 619 mil へ増加	アクティブではない顧客のアクティブ化、新規顧客の獲得、水質試験室の商業化、市場に合わせた料金体系の導入等	2021-2025	76
7	料金徴収率を 90%から 98%へ増加	料金請求の精度とタイミングの改善、未収金回収額の増加や効率化等	2021-2025	1.5

出典：EWASCO Strategic Plan（2021 年 6 月）

(2)　Meru WSP

表 2.2　MEWASS の水道施設への投資予算（中期計画案：2021-2026）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	Mutwaru プロジェクト	Nkunga と Ruiri Rwarera が対象	2023-2025	500
2	取水口の建設（Kathita 用の最初沈殿池）	Kathita から Milimani WTP までの並行導水管と高架タンクの建設	2021-2022	60
		空気ブロワーの購入	2023-2024	12
		取水口の建設・復旧	2022-2024	20
3	Kithaku 取水口の建設	-	2022-2023	800
4	顧客メーター	新規顧客メーターの設置	2021-2026	30
		給水停止中の接続の再開	2021-2026	4
5	老朽化・故障された顧客メーターの交換	3,000 台の交換	2021-2026	15
6	マスターメーターの導入	マスターメーター（300 mm）	2022-2026	2
		マスターメーター（250 mm）	2021-2022	0.45
		マスターメーター（200 mm）	2021-2022	1.4
		マスターメーター（150 mm）	2022-2025	0.645
		マスターメーター（100 mm）	2021-2026	1.5
7	導水管の敷設	延長（4 km）の敷設	2022-2023	40
8	貯水タンクの建設	容量（5,000 m^3）の建設	2022-2023	90
9	貯水タンクから Thuura までの配水管の敷設	延長（5 km）の敷設	2023-2024	7
10	Irinda 貯水タンクまでの送水管の敷設	延長（3 km）の敷設	2021-2022	6
		都市部及び LIA における送水管（50 km）の整備・延長・建設	2023-2024	150
11	逆洗浄水の循環場の建設	循環水量（8,000 m^3）	2024-2025	30
12	井戸の掘削（太陽電池式）	Kigure, Giaki, Kithoka, Kenya Re, Magundu, Thuura の 6 箇所	2021-2026	45
13	ウォーターキオスクの設置	設置数（6 箇所）	2021-2026	0.3
		家具付事務所数	2025-2026	1

出典：MEWASS Strategic Plan（2021 年 6 月）

(3)　Ngagaka WSP

表 2.3　NGAWASCO の水道施設への投資予算（中期計画案：2019-2024）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	浄水量を 3,833 から 9,017 m^3/日へ増加	Thuchi 取水口から Murram まで送水管（DN 250）の敷設	2024 年 6 月	26
2	KCC 地区の配水管の復旧	KCC から Kang'ethiri までの配水管（DN 50）の敷設	2020 年 6 月	2.5
3	Gikuuri 地区の配水管の復旧	Gikuuri 村までの配水管（DN 75）の敷設	2020 年 6 月	2.5
4	Kathuri から Kiraira 市場までの送水管の敷設	Kiraira 市場までの送水管（DN 150）の敷設	2024 年 6 月	5
5	無収水（NRW）ユニットの設立	マスター／ゾーンメーターの設置 ・四半期ごとにメーター精度の点検 ・一日当たり水使用量の傾向の分析	2019-2024	0.5
		サブゾーンメーター（4 台）の設置	2019-2024	0.5
		顧客メーター ・異常な水使用量の調査 ・検診に GIS の導入	2019-2024	1
		メーター（8 年以上）の交換	2019-2024	10
		顧客管理システムの改善	2019-2024	0.5
6	水道の契約数を 7,443 件から 10,693 件への増加	SMS、E メール、電話による懸案事項の解決	2019-2024	1
		27%の給水停止中の接続の再開		
7	水道料金回収率を年間 0.5%の向上	適切な検針	2019-2024	1
		適時に請求書の確認と作成		
		適時に請求書の支払期日のお知らせ		
		滞納金の回収活動の改善		
		期限内に水道料金の決済の推進		
		顧客との効果的なコミュニケーション		
		滞納金回収を担当する特定職員の任命		
		顧客の携帯電話番号の更新		
8	水道料金の請求の効率の向上及び新技術の導入（スマートメーター)	正確な実測メーターの確認	2019-2024	5
		給水区域の GIS マップ作成		
		検針員の監視		
		顧客と検針調整の連絡		

出典：NGAWASCO Strategic Plan

(4)　Murang'a WSP

表 2.4　MUWASCO の水道施設への投資予算（中期計画案：2020-2025）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	無収水率（NRW）を 15%へ削減	マスターメーターの設置	2021-2025	5
2	NRW に関する職員の研修	社内及び主催のトレーニングイベントで実施	2021-2025	1
3	資源動員の強化	事業提案書の作成	2021-2025	1.88
		利害関係者としての開発パートナーの特定		
		開発パートナーとの連携方針・フレームワークの策定		
4	事業予算枠の遵守	部門別予算の作成	2021-2025	1
		予算の統合		
		Board of Directors（BoD）による承認		
		毎月の支出実績と予算との比較分析		
		予算の見直し		
5	企業資源計画（Enterprise Resource Planning：ERP）による省資源化の推進	ニーズの把握と評価	2021-2025	9.5
		市場評価		
		エンドユーザトレーニング		
		契約管理		
6	コスト最適化の実現	良質の機材の使用	2021-2025	1
7	年間ワークプランの作成、実施、レビュー	年間ワークプランの調整と実行	2021-2025	0.1
8	資源動員戦略・方針の作成と実施	戦略方針（案）の作成	2021-2022	0.25
		BoD による承認		
9	水道料金の持続可能な水準への見直し	費用回収評価	2024-2025	1.2
		料金体系の見直し提案の作成		
		広告および提案の募集		
		利害関係者の意見の発表		
10	収益の改善	プロジェクト研究および影響評価	2021-2025	223
		事業計画		
		プロジェクトの実行		

出典：MUWASCO Strategic Plan

(5)　Ruiru-Juja WSP

表 2.5　RUJWASCO の水道施設への投資予算（中期計画案：2022-2027）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	浄水施設の建設	Githurai 浄水プロジェクト（13,000 m^3/日の増量）	2023-2024	-
		Karimenu II ダムの建設プロジェクト（47,000 m^3/日の増量）	2023-2025	-
2	浄水場の復旧	JICA の膜技術が導入された浄水場の f 復旧（110 m3/日の増量）	2022-2023	3
		飲料水の瓶詰め施設の設置	2023-2024	5
3	AWWDA、Gatundu 水から処理済みのバルクウォーターの取得	AWWDA に約 15,000 m^3/日のバルクウォーター供給の依頼	2024-2026	0.1
		バルクウォーター用送水本管の敷設	2025-2027	100
4	井戸の掘削	Mwihoko 地区における井戸（5 箇所）の掘削による 2,000 m^3/日の浄水量の増量	2022-2027	75
		Ruiru と Juja 地区における井戸の掘削による 4,000 m^3/日の浄水量の増量	2022-2027	180
		フッ素除去装置（2 台）の設置（Q = 40 m^3/h、15 m^3/h）	2023-2025	40
5	水源の保護	取水口の清掃	2022-2027	30
		Jacaranda 取水口のガビオン復旧工事	2023-2024 2025-2026	6
		Juja 取水口の洗掘弁の設置	2023-2024	0.8
6	浄水場用予備発電機の納入・設置	Juja 浄水場用予備発電機（500 Kva）の納入・設置	2022-2023	15
		Ruiru 事務所用予備発電機（350 Kva）の納入・設置	2024-2025	10
7	雨水利用の促進	啓発活動（20 回）の開催	2022-2027	2
		雨水利用システムを全 4 社施設と 13 公共機関の設置	2022-2027	5.1
8	浄水場の改善	Ndarugo 浄水場へのアクセス道路の建設	2022-2023	1.7
		Ndarugo 浄水場における警備員室建設	2022-2023	0.5
		Jacaranda 取水口のポンプ室の改善	2023-2024	1.5

出典：RUJWASCO Strategic Plan

(6)　Mavoko WSP

表 2.6　MAVWASCO の水道施設への投資予算（中期計画案： 2016-2021）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	KMC ダム開発（ダム、浄水場、取水口）	ダムの設計	2015 年 10 月	20
		清掃と建設	2017 年 10 月	200
		ダムの運用化	2017 年 12 月	220
2	Portland ダム／浄水場の拡張	ダムの再設計	2015 年 1 月	20
		清掃と建設	2016 年 12 月	118
		新沈殿池の建設	2016 年 12 月	10
		ダムの委託	2016 年 12 月	2
3	井戸の掘削	水文調査の実施	2016 年 2 月	2
		水文調査の推奨事項の実行	2018 年 12 月	15
4	Ndarugu の開発	ダムの設計、建設、試運転における関係者との連携	2016 年 12 月	2
5	Nolturesh 導水管の復旧	Noltruresh 導水管の復旧作業に向けた TAWSB のフォローアップ	2016 年 3 月	10
6	GIS の導入	GIS ソフトウェアとハードウェアの調達	2016 年 12 月	3
		顧客の情報収集	2016 年 2 月	2
		顧客及び管轄地域のデータのデジタル化	2017 年 2 月	3
		管轄区域のマッピング	2017 年 6 月	1
7	技術に準じたメーターの使用	スマートメーターの調達	2016-2021	2
		開発者/顧客へスマートメーターのメリットの意識の啓発	2016-2021	0.2
8	検針に技術の活用	検針システムの調達	2016 年 12 月	3.5
		検針システムの運用化	2016 年 3 月	0.3
9	漏水検知・管理	NRW ユニットによる施設監視の実施	2016-2021	0.4
		漏水検知機の調達	2016 年 12 月	3
		修理対応フレームワークの開発	2015 年 12 月	1.5
10	職員、顧客、コミュニティーへの啓発	職員へ漏水発見の報告の啓蒙活動	2016-2021	0.2
		国民へ漏水の報告経路と手続きの周知	2016-2021	0.2
11	水分配バランス	管轄区域を配水区域への区分	2016 年 12 月	0.5
		スマートメーターの設置	2017 年 1 月	1.2
12	水道施設の継続的な維持管理	水道施設の欠陥部分の特定	2016-2021	10
		必要な資材や専門知識の調達		
		特定された欠陥部分の交換		
13	NRW ユニットの強化	研修を通じたユニットの能力強化の実施	2016-2021	-
		ユニットへ適切なリソースの提供	2016-2021	-
		検査・監視の実施	2016-2021	-
		メーターサービス	2016-2021	0.2
14	最優秀業績となる水道事業体との比較検証	NRW の観点で最も実績のある事業体を特定し、その事業体企業を訪問する	2016-2021	0.2

出典：MAVWASCO Strategic Plan

(7)　Nakuru WSP

表 2.7　NAWASSCO の水道施設への投資予算（中期計画案：2020-2023）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	浄水量を 40,000 から 60,700 m^3/日への増量	Kiundo 井戸の掘削	2020-2021	14
		2,000 m^3/日の浄水量を生産するための Mereroni 導水管（8 km）の迂回		
		井戸（5 箇所）の掘削による 15,680 m^3/日の原水量の増量	2021-2023	878
		水道サービスを提供するために、CRWWDA/県庁との密接な連携	2020-2023	<1
2	水道普及率を 93%から 95%への改善	Koinange 地区における配水管の敷設	2021-2022	
		Mwariki East 地区における配水管の敷設とメーターリングの実施	2021-2022	19.9
		Barnabas 地区における配水管の敷設とメーターリングの実施	2020-2021	9.7
		ポンプセットと装置一式	2020-2023	10.3
		井戸の自動化	2020-2023	32.3
		水道メーター（6,000 台）の設置	2020-2023	66.3
		バルクメーター（10 台/年）の設置	2020-2023	10.5
		区域別・地域別メーターリング	2021-2023	20
3	給水時間を 18 から 20 時間/日への延長	必要な圧力における給水能力の確保	2020-2023	57
4	無収水率（NRW）を 31%から 25 への削減	全ての水道メーターに QR コードを搭載することで正確な検針への実現	2020-2021	5
		顧客メーターを最寄りの配水管に移設	2020-2021	1
		全地区における送水・配水管の復旧	2020-2023	30
5	水質の改善	水質基準遵守率を 97%から 100%への向上	2020-2023	-
		浄水場のろ材の定期的な交換	2021-2023	3

出典：NAWASSCO Strategic Plan

(8)　Nanyuki WSP

表 2.8　NAWASCO の水道施設への投資予算（中期計画案：2019-2023）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	配水管網の詳細設計の実施	詳細技術設計、ESIA、及び入札書類の作成	2019-2020	10
2	水源を 3,000 m^3/日への増量	井戸（4 箇所）の掘削	2019-2020	41
3	配水管網の復旧	様々なサイズ/直径の配水管（256 km）の敷設	2020-2023	852
		循環水槽・タンク（500 m^3）の建設	2019-2020	20
4	低所得者層向け政策・戦略の策定	水道の契約数（6,957）の追加	2019-2023	25
		ウォーターキオスク（5 箇所）の設置	2019-2021	3
		1,000 m3 のバランス水槽（3 台）の建設	2019-2020 2023	45
		公共水栓（200 箇所）の設置	2019-2023	1
		低所得者層向け政策の策定・実施	2019-2023	2.5
5	無収水（NRW）の詳細評価の実施	NRW の現状に関する詳細な報告の作成	2019-2020	7
6	NRW 方針の策定	-	2019	0.3
7	水理学解析の実施	減圧弁の設置	2019-2023	3
8	配水管網の分離	DMA（10 箇所）の構築	2019	0.1
		DMA メーター（10 箇所）の導入	2019-2023	12.5
9	全ての水道管網及び付帯設備のマッピング	GIS データベース／デジタルマップの導入	2019-2023	5
10	老朽化された設備・浄水場・機器の更新	修理・点検スケジュールの効率化	2019-2023	25
		ICT 設備の改善	2019-2023	3

出典：NAWASCO Strategic Plan

(9)　Eldoret WSP

表 2.9　ELDOWAS の水道施設への投資予算（中期計画案：2022-2027）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	新規設備の建設、既存設備の拡張	Chebara 水源の増量（7,000 m^3）	2022	550
		Kipkaren 給水プロジェクト（24,000 m^3）	2022 年 1 月	1,300
		Sosiani 浄水場の補強による効率化（3,000 m^3）	2022	20
		Two Rivers ダムの建設（53,000 m^3）と Sosiani 浄水場の拡張	2023-2026	9,000
		Kesses 浄水場の拡張（900 m^3）	2022-2023	30
2	配水管網の拡大（10 km/年）	配水管網の延長（Kapsaret、Kuinet、Maili Nne、Marakwet 農場）	2022-2026	75
3	水道メーターの自動化	調達方針に基づくスマートメーターの調達	2022-2026	240
		スマートメーター用インフラの設置		
4	効果的かつ効率的なプロジェクトモニタリング手法の促進	SCADA の導入	2023-2024	50
5	老朽化された設備（メーター、管きょ、付帯設備）の交換	インフラアセスメントの実施	2022-2026	250
		調査報告書の作成		
6	DMA の構築	-	2022-2023	65
7	違法接続と盗水に関する啓蒙活動	水の違法使用に対する罰則に関する県条例の見直し	2022-2026	5
		職員と顧客への啓発の実施		
8	収益回収の効率化	滞納金回収方針の徹底	2022-2026	50
		新水道料金体系の導入	2022-2026	10

出典：ELDOWAS Strategic Plan（2021 年）

(10)　Kisumu WSP

表 2.10　KIWASCO の水道施設への投資予算（中期計画案：2017-2022）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	Kajulu 浄水場と Dunga 浄水場の施設の改善	Dunga 浄水場における既存遮水壁の再整備（水草の侵入をより効果的に抑制するため）	2021-2022	200
		微生物検査室の改修と設備増強	2017-2022	10
		貯水タンク、沈殿池と逆洗槽の漏水復旧	2019-2022	25
		Dunga 浄水場における可変速駆動装置の設置	-	12
		老朽化されたポンプとモーターの交換	2019-2022	30
		エネルギー監査の実施	2019-2022	5
		Kajulu 浄水場と Dunga 浄水場における汚泥貯留槽の建設	2019-2020	100
2	配水管網の改善	老朽化された設備の交換（HDPE : 15 年以上、水道メーター：8 年以上）	2017-2022	200
		配水管網の要所にバルブ、圧力計、水位計などの設置	2017-2022	10
		残留塩素処理ポイントの設置	2019-2022	0.5
		水質監視装置の設置	2019-2022	2
3	水道拡張による水道普及率の向上	未給水地域への水道拡張（約 250 km）	2017-2022	100
		過疎地域への水道拡張	2017-2022	50
4	漏水検知と制御	CRM、ERP、MOBILE による漏水対応時間の改善	2019-2020	2
		顧客への啓発活動の実施	2017-2022	5
		漏水検知・制御機器の調達	2020-2022	5
		積極的な漏水検知と制御の実施	2017-2022	3.6
		漏水報告表彰制度の準備と実施	2020-2022	1.5
		四半期ごとに大規模な配管パトロールの実施	2019-2022	1.5
5	水圧管理	デジタル圧力ロガーの調達	2021-2022	2
		減圧弁、サージプロテクター、持圧弁の調達・設置	2020-2022	10
		浄水場におけるの圧力スイッチの設置・校正	2019-2020	1
		圧力監視ソフトの調達	2021-2022	1
6	アセットマネジメントの強化	空気弁、チャンバーの新規調達	2017-2022	30
		水道アセットマネジメントの策定と実施	2020-2021	0.2
		GIS によるアセットマネジメントの向上	2021-2022	1.5
7	顧客メーター精度の向上	メーター管理方針の見直しと実施	2017-2022	0.1
		頻繁なメーターの点検、検査、校正	2017-2022	0.5
		水需要が高い顧客向けプリペイド・メーターの研究・実証実験	2017-2022	10
		老朽化、故障されたメーターの交換	2017-2022	10

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
		メーターのサイズ変更と再調整の実施	2017-2022	3
8	水の違法使用	メーター不正改ざん防止シールの大量設置、メーター追跡システムの運用	2019-2022	1.5
		全消火栓のメーターリングと監視	2017-2022	2.5
		違法接続の検査チームと検針員の研修	2019-2022	0.6
		給水停止中の接続の調査	2019-2022	5
9	検針ミスの解消	パイロット遠隔検針	2020-2022	6
		検針ソフトの調達と導入	2019-2022	50
10	DMA の構築	マスターメーターの調達、旧 DMA の見直し及び新 DMA の構築	2017-2022	25
		最低夜間流量テストとステップテストの実施	2017-2022	2
		DMA 管理者制度の導入	2019-2022	10
		漏水検知のための水道圧力調査の実施	2017-2022	3
		水収支の作成と実施	2021-2022	0.5
11	無収水（NRW）削減フレームワークの見直し	NRW 削減戦略の見直し	2017-2022	05
		NRW 担当者の配置・育成	2017-2022	10

出典：KIWASCO Strategic Plan（2020 年 4 月改訂）

(11)　Nzoia WSP

表 2.11　NZOWASCO の水道施設への投資予算（中期計画案：2019-2022）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	給水時間 18 から 22 時間/日への延長	緊急事態対応計画の見直しためのスケジュールの策定	2022	6
		クラスター内の全ゾーンに均等に水の供給		
		貯水量の増量		
		代替電源の導入		
		断水復旧の遅れを 1 日以内に短縮		
2	水道接続の拡張	・顧客クラスの特定による適切な水道サービスの提供 ・給水停止の接続の削減 ・給水停止中の接続の再開 ・配水管網の拡張	2022	20
3	水道普及率（95%）への改善	Chesikaki、Kapkateny、Teremi における浄水場及び付帯設備の建設・復旧	2022	100
		既存太陽発電式の井戸の復旧と電力供給		
		給水停止中の接続の再開		
		給水人口を 60 万人への増加		
		浄水量を 800 万 m^3/日への増量		
		対象都市を 6 町への増加		
		生活用水を 250 万 m3 までの増量		
		貯水タンクの建設		
		Kanduyi から Kibabii までの送水本管の敷設		
4	無収水率（NRW）の削減	NRW ユニットの設立	2022	40
		NRW 管理における技術の採用		
		漏水・破裂への迅速な対応強化		
		DMA の構築		
		スマートメーターの導入		
		圧力ロガーの設置		
		遠隔検針		
		全地域におけるゾーンメーターの設置・モニタリング		
		道路工事による水道破損の防止		
5	給水量の測定の強化	貧困削減政策の実施	2020	10
		貧困削減の給水地域のマッピング		
		違法接続の削減		
6	水道設備の改善	全ての施設とアセットに関するマスタープランの管理	2022	100
		設備の管理による運用ニーズと信頼性目標の達成		
		事業および資本予算プロセスにおける優先順位の設定		
		設備性能の最適化と信頼性の向上		

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
		追加の水資源の計画・確保		
7	水質の改善	水源から蛇口までの積極的な管理・監視方法の開発	2021	10
		配水系統の水質をモデル化する社内能力の開発		
		水質基準の遵守		

出典：NZOWASCO Strategic Plan（2019 年 3 月）

(12) Isiolo WSP

表 2.12　IWASCO の水道施設への投資予算（中期計画案：2019-2023）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	水道普及率を79%から 90%への改善	井戸の掘削による代替水源の特定	2019-2023	25
		機能不全の井戸の修復	2019-2022	2
		4,500 m^3 から 9,000 m^3 への取水・浄水能力増量に対応するためのシステムアップ	2021-2023	120
		水道拡張	2019-2023	50
		低所得者層の水へのアクセスを向上させるためのウォーターキオスクの建設	2019-2023	2.5
		集水域の保護に関する地域社会への啓蒙活動	2019-2023	0.5
2	無収水（NRW）を34％から 30%への削減	NRW ユニットの設立	2019-2023	4
		破裂や漏水への対応時間の改善	2019-2023	10
		HDPE の導入による老朽された水道の置き換え	2019-2023	37.5
		NRW に関する職員の研修	2019-2023	1
		NRW に関する顧客への啓発	2019-2023	1
3	O&M のコストリカバリーを 99%から 120%以上への改善	最新の水道料金請求システム及びモバイル検針システムの導入	2019-2023	8
		違法接続の特定	2019-2023	1
		水道料金体系の改定・調整	2019-2020	0.5
		故障されたメーターの交換	2019-2023	20

出典：IWASCO Strategic Plan

(13)　Mombasa WSP

表 2.3　MOWASSCO の水道施設への投資予算（中期計画案：2018-2022）

No.	目的	施設投資等の活動	実施年度	予算（KSH Mil）
1	民間企業との官民連携（PPP）	違法接続の解消	2018-2022	5
		正確な請求と回収の実現	2018-2022	N/A
		故障されたメーターの迅速な修理	2018-2022	N/A
		給水停止中の接続の再開	2018-2022	64.75
		スマートメーター（200 台）とロバスト・メーター（15,000 台）の設置	2018-2022	154
2	無収水（NRW）を 34％から 30%への削減	水道料金請求精度の向上	2018-2022	ND
		水道施設の品質向上と O&M 組織の改善	2018-2022	4,641
		KWSCRP1-AF の資金による NRW/DMA プログラムの実施	2018-2022	2,263
		水の違法使用への厳格な措置の実施	2018-2022	N/A

ND: No Data
出典：MOWASSCO Strategic Plan

参考資料 - 6

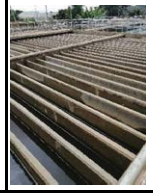
候補 13 WSPs の既存水道施設

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (1/8)

Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
Intake	Mwiria intake (28,000 ㎥/d, 2006)  Condition: Good	Mereroni Intake (6,000 ㎥/d, 1913)  Condition: Deteriorating	Dunga Intake (44,000 ㎥/d, 2011)  Condition: Fair Kajulu Intake (36,000 ㎥/day, 2014)  Condition: Good	Ellegerini Intake (9,000 ㎥/d, 1997)  Condition: Good Moiben Dam (34,000 ㎥/d, 1997)  Condition: Good	Bungoma Intake (7,500 ㎥/d, 2006)  Condition: Deteriorating Kapolet intake (10,500 ㎥/d,2006)  Condition: Deteriorating	Thambana Intake (9,900 ㎥/d, 1982)  Condition: Fair Irangi intake (9,000 ㎥/d, 2012)  Condition: Fair
WTP 1	Mukangu WTP (28,000 ㎥/d, 2006) Receiving / Coagulant Dosing  Flocculation Basin 	Mereroni WTP (6,000 ㎥/d, 1913) Receiving / Coagulant Dosing  Flocculation Basin 	Dunga WTP (45,600 ㎥/d, 2011) Receiving / Coagulant Dosing  Flocculation Basin 	Sosiani WTP (14,950 ㎥/d, 1986) Receiving / Coagulant Dosing  Flocculation Basin 	Bungoma WTP (7,500 ㎥/d) Receiving / Coagulant Dosing  Flocculation Basin 	Kathuniri WTP (6,825 ㎥/d, 1982) Sedimentation basin 

参考資料 6-2

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (2/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
Intake	Kathita Intake (6,000 ㎥/d, 1985)   Condition: Good	Isiolo Intake - 1 (1,500 ㎥/d, 2016)  Isiolo Intake - 2 (1,500 ㎥/d, 2016)   Condition: Fair	Nanyuki Intake (14,658㎥/d, 1983)   Condition: Deteriorating	Kasoito Intake (3,000 ㎥/d, 2021)  KMC Intake (8,000 ㎥/d, 2021)  Condition: Deteriorating	Irati Intake (15,000 ㎥/d, 2013)  Condition: Good Kayahwe Intake (5,000 ㎥/d, 1975)  Condition: Fair	Jacaranda Intake (13,000 ㎥/d, 2013)  Juja intake (6,500 ㎥/d, 1986)  Condition: Good
WTP 1	Milimani WTP (13,944 ㎥/d, 2017) Receiving / Coagulant Dosing  Flocculation Basin 	Isiolo WTP (3,000㎥/d) Receiving / Coagulant Dosing  Flocculation Basin 	Kanyoni WTP (11,248 ㎥/d, 1983) Receiving / Coagulant Dosing  Flocculation Basin 	Mavoko (New) WTP (10,000㎥/d, 2021) Receiving / Pre-sedimentation 	Kiawambeu WTP (15,000 ㎥/day, 2014) Receiving / Coagulant Dosing  Flocculation Basin 	Jacaranda WTP (13,000 ㎥/d, 2013) Receiving / Coagulant Dosing  Flocculation Basin 

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (3/8)

Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
WTP 1	Sedimentation Basin  Filtration Basin  Backwashing / Chlorination   Condition: Fair	Sedimentation Basin  Filtration Basin  Chlorination  Condition: Good	Sedimentation Basin  Filtration Basin  Backwashing  Condition: Deteriorating	Sedimentation Basin  Filtration Basin  Backwashing / Chlorination  Condition: Good	Sedimentation Basin  Filtration Basin  Backwashing  Condition: Deteriorating	Sedimentation Basin  Chlorination  Condition: Deteriorating

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (4/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
WTP 1	Sedimentation Basin  Composite Unit  Condition: Good	Sedimentation Basin  Filtration Basin  Backwashing  Condition: Fair	Sedimentation Basin  Filtration Basin / Chlorination  Clear Water Tank  Backwashing  Condition: Deteriorating	Sedimentation Basin  Filtration Basin  Clear Water Tank  Backwashing  Condition: Good	Sedimentation / Filtration Basin  Pre-chlorination / Chlorination  Clear Water Tank  Backwashing  Condition: Good	Sedimentation basin  Filtration Basin  Clear Water Tank  Backwashing  Condition: Good

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (5/8)

Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
WTP 2		Makewa WTP (2,500m³/day, 1952) Coagulant / Flocculation Basin  Sedimentation Basin  Filtration / Chlorination  Backwashing  Condition: Good	Kajulu WTP (36,000m³/d, 2014) Receiving / Coagulant Dosing  Flocculation Basin  Filtration Basin  Condition: Fair	Chabara WTP (28,300m³/day, 1995) Receiving / Coagulant Dosing  Sedimentation Basin  Filtration Basin  Condition: Good	Kapolet WTP (10,500m³/d, 2006) Receiving / Coagulant Dosing  Sedimentation Basin  Filtration Basin  Backwashing  Condition: Deteriorating	

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (6/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
WTP 2	Kigure WTP (1,850 ㎥/d, 2013) Receiving / Coagulant Dosing  Direct Filtration Unit 	Mwangaza WTP (4,500 ㎥/d, 2016) Receiving / Coagulant Dosing  Flocculation Basin  Sedimentation Basin  Filtration Basin  Chlorination 		Mavoko (Old) WTP (2,000㎥/d, 2012) Receiving / Coagulant Dosing  Flocculation Basin  Composite unit  Composite unit 	Kayahwe WTP (5,000 ㎥/d, 1975) Receiving / Flocculation Basin  Sedimentation Basin  Filtration Basin  Pre-chlorination  Clear Water Tank 	Juja WTP (6,000 ㎥/d, 2013) Receiving / Coagulant Dosing  Flocculation Basin  Sedimentation Basin  Filtration Basin  Composite Unit 

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (7/8)						
Facility	Embu WSP (EWASCO)	Nakuru WSP (NAWASSCO)	Kisumu WSP (KIWASCO)	Eldoret WSP (ELDOWAS)	Nzoia WSP (NZOWASCO)	Ngagaka WSP (NGAWASCO)
Reservoir		Mereroni Reservoir (3,375m³, 1983)  Condition: Good Malewa reservoir (1,000m³, 1952)  Condition: Good	Kibuye Reservoir (12,000m³, 2011)  Condition: Good Obwolo Reservoir (1,300m³, 2012)  Condition: Good			
Others		Nairobi Road Boreholes (3,375m³, 1964)  Condition: Fair				

Current Status of Intake, WTP and Reservoir of 13 Candidate WSPs (8/8)

Facility	Meru WSP (MEWASS)	Isiolo WSP (IWASCO)	Nanyuki WSP (NAWASCO)	Mavoko WSP (MAVWASCO)	Murang'a WSP (MUWASCO)	Ruiru-Juja WSP (RUJWASCO)
WTP 2	Clear Water Tank  Storage and Backwashing Tank  Condition: Good	Clear Water Tank  Backwashing  Condition: Fair		Backwashing  Condition: Fair	Backwashing  Gikoe WTP (Potential Site)  Condition: Fair	Clear Water Tank  Backwashing  Condition: Good
Reservoir / Others	Kinoru Reservoir (988 ㎥, 2003)  Condition: Good	Borehole (Isiolo WTP)  Condition: Good Solar Panel  Condition: Good	Katheri Elevated Steel Tank (108 ㎥, 2019)  Condition: Good Borehole (Katheri-Nyariginu)  Condition: Good			Borehole (Mugutha)  Condition: Good