11.3 Allowable Pollution Load and Required Pollution Load Reduction

Table 11.3.1 Allowable Polliution Load by Source Category (BOD, Scenario 1)

2005

2005						Allowable
Water Quality Checking Point	Planned Flow Rate (m3/day)	Water Quality Standard (mg/l)	Allowable Run-off Pollution Load (kg/d)	BOD Load Source Category	Present Run-off BOD Composition (%)	Allowable Run-off Pollution Load (kg/d)
C _{R1}	31,000	5.0	149	Domestic Ind.(Unsewered) Livestock Solid Waste WTW Natural	65,46% 0.00% 34.54% 0.00% 0.00%	98 0 52 0 0
C _{R2}	335,300	5.0	155	Total Domestic	100.00% 80.28% 6.91%	155 1,318 113
4.	·		1,642	Ind.(Unsewered) Livestock Solid Waste WTW	0.91% 12.25% 0.00% 0.57%	201 0 9
			12 22 1,677	Natural C _{R1} *	100.00%	12 22 1,677

2015

2015						
Water Quality Checking Point	Planned Flow Rate (m3/day)	Water Quality Standard (mg/l)	Allowable Run-off Pollution Load (kg/d)	BOD Load Source Category	Present Run-off BOD Composition (%)	Allowable Run-off Pollution Load (kg/d)
C _{R1}	31,000	3.0	87 6 93	Domestic Ind (Unsewered) Livestock Solid Waste WTW Natural Total	65.46% 0.00% 34.54% 0.00% - - 100.00%	57 0 30 0 0 6
C _{R2}	430,700	5.0	2,128 12 13 2,154	Domestic Ind.(Unsewered) Livestock Solid Waste WTW Natural C _{R1} * Total	80.28% 6.91% 12.25% 0.00% 0.57% - - 100.00%	1,708 147 261 0 12 12 13 2,154

Note: Natural Pollution Load is fixed.

 C_{R1}^* = Allowable Run-off Load at C_{R1} x Pollution Load remaining Ratio (C_{L1} x R_{R3} x C_{R2})



2003						
Water Quality Checking Point	Planned Flow Rate (m3/day)	Water Quality Standard (mg/l)	Allowable Run-off Pollution Load (kg/d)	BOD Load Source Category	Present Run-off BOD Composition (%)	Allowable Run-off Pollution Load (kg/d)
C_{R1}	31,000	5.0	7	Domestic	65.46%	98
				Ind.(Unsewered)	0.00%	0
			149	Livestock	34.54%	52
				Solid Waste	0.00%	0
				WIW	0.00%	0
		;	6	Natural	-	6
			155	Total	100.00%	155
C _{R2}	310,600	5.0		Domestic	80.28%	1,219
			}	Ind.(Unsewered)	6.91%	105
			1,519	Livestock	12.25%	186
				Solid Waste	0.00%	0
				WIW	0.57%	9
			12	Natural		12
			22	C _{R1} *	-	22
			1,553	Total	100.00%	1,553

2015

Water Quality Checking Point	Planned Flow Rate (m3/day)	Water Quality Standard (mg/l)	Allowable Run-off Pollution Load (kg/d)	BOD Load Source Category	Present Run-off BOD Composition (%)	Allowable Run-off Pollution Load (kg/d)
C _{R1}	31,000	3.0	87	Domestic Ind (Unsewered) Livestock Solid Waste WTW Natural	65.46% 0.00% 34.54% 0.00% -	57 0 30 0 0 6
C _{R2}	432,800	5.0	2,138 12 13 2,164	Total Domestic Ind.(Unsewered) Livestock Solid Waste WTW Natural C _{R1} * Total	100.00% 80.28% 6.91% 12.25% 0.00% 0.57%	93 1,717 148 262 0 12 12 13 2,164

Note: Natural Pollution Load is fixed.

 C_{R1}^* = Allowable Run-off Load at C_{R1} x Pollution Load remaining Ratio (C_{L1} x R_{R3} x C_{R2})

Table 11.3.3 Allowable Polllution Load (T-N, Scenario 1)

Basic formula for pr	ojection of T-N concentration:		
	$(x \lor y)$ or $L(N) = N \times ((rw + sN) \times V)$		
where: N:	T-N concentration of lake/dam (mg/l)		
L(N):	Quantity of inflow Nitrogen to lake (g/day)		
rw:	Rate of change of water (1/day)		
sN:	Self-purification (reduction) coefficient for Nitrogen		
V:	Volume of lake (m3)		
Allowable Pollution	Load in 2005:		
	e & Harava Dams);		
N:	T-N concentration of lake/dam (mg/l)	=	0.4
cv:	Rate of change of water (1/day)	=	0.015484
sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.187972
V:	Volume of lake (m3)	=	12,406,000
	Therefore, $L(N) = 1,009,632 \text{ (g/day)} \text{ or}$	1,010	(kg/day)
CL2 (Lak	re Chivero)		
N:	T-N concentration of lake/dam (mg/l)	=	0.4
rw:	Rate of change of water (1/day)	=	0.002025
sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.042699
V:	Volume of lake (m3)	=	257,181,000
	Therefore, $L(N) = 4,600,841 \text{ (g/day) or}$	4,601	(kg/day)
CL3 (Lak	se Manyame)		
N:	T-N concentration of lake/dam (mg/l)	=	0.4
rw:	Rate of change of water (1/day)	=	0.000550
sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.011512
V:	Volume of lake (m3)	=	480,236,000
	Therefore, $L(N) = 2,317,013 \text{ (g/day) or}$	2,317	(kg/day)
Allowable Pollution	Load in 2015:		
CL1 (Se)	te & Harava Dams);		
N:	T-N concentration of lake/dam (mg/l)	==	0.2
rw:	Rate of change of water (1/day)	=	0.015750
sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.187972
V:	Volume of lake (m3)	=	12,406,000
	Therefore, $L(N) = 505,476$ (g/day) or	505	(kg/day)
CL2 (Lai	ke Chivero)		
N:	T-N concentration of lake/dam (mg/l)	=	0.2
rw:	Rate of change of water (1/day)	=	0.002515
sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.042699
V:	Volume of lake (m3)	=	257,181,000
	Therefore, $L(N) = 2,325,661 \text{ (g/day) or}$	2,326	(kg/day)
CL3 (Lal	ke Manyame)		
N:	T-N concentration of lake/dam (mg/l)	=	0.2
rw:	Rate of change of water (1/day)	=	0.000555
sN:	Self-purification (reduction) coefficient for Nitrogen	==	0.011512
V:	Volume of lake (m3)	=	480,236,000
	Therefore, L(N) = 1,159,007 (g/day) or	1,159	(kg/day)

Table 11.3.4 Allowable Polllution Load (T-N, Scenario 2)

Basic form	ula for p	rojection of T-N concentration:		
N = L(N)/((rw + sh	I(x V) or $I(N) = Nx((rw + sN)xV)$		
where:	N:	T-N concentration of lake/dam (mg/l)		
	L(N):	Quantity of inflow Nitrogen to lake (g/day)		
	rw:	Rate of change of water (1/day)		
	sN:	Self-purification (reduction) coefficient for Nitrogen		
	V:	Volume of lake (m3)		
Allowable I	ollution	Load in 2005:		
(CL1 (Sek	te & Harava Dams);		
	N:	T-N concentration of lake/dam (mg/l)	=	0.4
	rw:	Rate of change of water (1/day)	=	0.015428
	sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.187972
	V:	Volume of lake (m3)	=	12,406,000
	.,	Therefore, $L(N) = 1,009,352 \text{ (g/day) or}$	1,009	(kg/day)
(CL2 (Lak	te Chivero)		
	N:	T-N concentration of lake/dam (mg/l)	==	0.4
	rw:	Rate of change of water (1/day)	=	0.001713
	sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.042699
	V:	Volume of lake (m3)	=	257,181,000
	٧.	Therefore, $L(N) = 4.568,801$ (g/day) or	4,569	(kg/day)
			·	
•	-	ke Manyame)		
	N:	T-N concentration of lake/dam (mg/l)	=	0.4
	rw:	Rate of change of water (1/day)	==	0.000549
	sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.011512
	V:	Volume of lake (m3)	=	480,236,000
		Therefore, $L(N) = 2,316,853$ (g/day) or	2,317	(kg/đay)
Allowable I	Pollution	Load in 2015:		
•	CL1 (Sek	se & Harava Dams);		
	N:	T-N concentration of lake/dam (mg/l)	=	0.2
	rw:	Rate of change of water (1/day)	=	0.015662
	sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.187972
	V:	Volume of lake (m3)	=	12,406,000
		Therefore, $L(N) = 505,256$ (g/day) or	505	(kg/day)
•	CL2 (Lak	ke Chivero)		
	N:	T-N concentration of lake/dam (mg/l)	=	0.2
	rw:	Rate of change of water (1/day)	=	0.002311
	sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.042699
	V:	Volume of lake (m3)	=	257,181,000
	••	Therefore, L(N) = 2,315,141 (g/day) or	2,315	(kg/day)
4	C[37] at	ke Manyame)		
'	N:	T-N concentration of lake/dam (mg/l)	=	0.2
	rw:	Rate of change of water (1/day)	=	0.000552
	sN:	Self-purification (reduction) coefficient for Nitrogen	=	0.000532
	814. V:	Volume of lake (m3)	=	480,236,000
	٧.	Therefore, L(N) = 1,158,727 (g/day) or	1,159	(kg/day)
		Incivious, Equip - Islausini (gaussion	-,/	("8""))

Table 11.3.5 Allowable Polliution Load (T-P, Scenario 1)

Basic formula for pr P = L(P)/((rw + sP))	ojection of T-P concentration: (x V) or L(P) = P x ((rw + sP) x V)		
where: P:	T-P concentration of lake/dam (mg/l)		
L(P):	Quantity of inflow Phosphorus to lake (g/day)		
rw:	Rate of change of water (1/day)		
sP:	Self-purification (reduction) coefficient for Phosphorus		
V:	Volume of lake (m3)		
Allowable Pollution	Load in 2005:		
CL1 (Sek	e & Harava Dams);		0.05
P:	T-P concentration of lake/dam (mg/l)	==	0.05
rw:	Rate of change of water (1/day)	=	0.015484
sP:	Self-purification (reduction) coefficient for Phosphorus	=	0.205736
V:	Volume of lake (m3)	= 127	12,406,000
	Therefore, $L(P) = 137,223 \text{ (g/day) or}$	137	(kg/day)
•	te Chivero)		0.10
P:	T-P concentration of lake/dam (mg/l)	=	0.002025
rw:	Rate of change of water (1/day)	=	0.002025
sP:	Self-purification (reduction) coefficient for Phosphorus	=	257,181,000
V:	Volume of lake (m3)	- 275	(kg/day)
	Therefore, $L(P) = 275,177 (g/day)$ or	213	(v8/ga))
•	te Manyame)	_	0.03
P :	T-P concentration of lake/dam (mg/l)	=	0.000550
rw:	Rate of change of water (1/day)	=	0.000330
sP:	Self-purification (reduction) coefficient for Phosphorus	=	480,236,000
V:	Volume of lake (m3)	= 407	(kg/day)
	Therefore, $L(P) = 406,869 (g/day)$ or	107	(18/00)
Allowable Pollution	Load in 2015:		
CL1 (Se)	ce & Harava Dams);		0.01
P:	T-P concentration of lake/dam (mg/l)	=	0.015750
rw:	Rate of change of water (1/day)	=	0.205736
sP:	Self-purification (reduction) coefficient for Phosphorus	=	12,406,000
V:	Volume of lake (m3) Therefore, L(P) = 27,478 (g/day) or	27	(kg/day)
	ke Chivero)	_	0.01
P :	T-P concentration of lake/dam (mg/l)	=	0.002515
rw:	Rate of change of water (1/day)	=	0.002515
sP:	Self-purification (reduction) coefficient for Phosphorus	=	257,181,000
V:	Volume of lake (m3) Therefore, L(P) = 28,780 (g/day) or	29	(kg/day)
-	ke Manyame)	_	0.01
P:	T-P concentration of lake/dam (mg/l)	=	0.000555
ıw:	Rate of change of water (1/day)	=	0.00555
sP:	Self-purification (reduction) coefficient for Phosphorus	- =	480,236,000
V:	Volume of lake (m3) Therefore, L(P) = 135,648 (g/day) or	136	(kg/day)
	Indictore, May 10000 (Boat) or		/

Table 11.3.6 Allowable Polllution Load (T-P, Scenario 2)

		, ,	•	
Basic for	mula for p	rojection of T-P concentration:		
P = L(P) /	((rw+sP	(x V) or $L(P) = P x ((rw + sP) x V)$		
where:	P:	T-P concentration of lake/dam (mg/l)		
	L(P):	Quantity of inflow Phosphorus to lake (g/day)		
	rw:	Rate of change of water (1/day)		
	sP:	Self-purification (reduction) coefficient for Phosphorus		
	V:	Volume of lake (m3)		
Allowable	Pollution	Load in 2005:		
	CL1 (Sel	ce & Harava Dams);		
	P:	T-P concentration of lake/dam (mg/l)	=	0.05
	rw:	Rate of change of water (1/day)	=	0.015428
	sP:	Self-purification (reduction) coefficient for Phosphoru	=	0.205736
	V:	Volume of lake (m3)	=	12,406,000
		Therefore, $L(P) = 137,188 \text{ (g/day) or}$	137	(kg/day)
	CL2 (La)	se Chivero)		
	P:	T-P concentration of lake/dam (mg/l)	==	0.10
	rw:	Rate of change of water (1/day)	=	0.001713
	sP:	Self-purification (reduction) coefficient for Phosphoru	==	0.008675
	V:	Volume of lake (m3)	=	257,181,000
		Therefore, $L(P) = 267,167 \text{ (g/day) or}$	267	(kg/day)
	CL3 (Lal	ke Manyame)		
	P:	T-P concentration of lake/dam (mg/l)	==	0.03
	rw:	Rate of change of water (1/day)	=	0.000549
	sP:	Self-purification (reduction) coefficient for Phosphoru	=	0.027691
	V:	Volume of lake (m3)	=	480,236,000
		Therefore, $L(P) = 406,857$ (g/day) or	407	(kg/day)
Allowable	Pollution	Load in 2015:		
	CL1 (Sel	ke & Harava Dams);		
		T-P concentration of lake/dam (mg/l)	=	0.01
	rw:	Rate of change of water (1/day)	=	0.015662
	sP:	Self-purification (reduction) coefficient for Phosphoru	=	0.205736
	V:	Volume of lake (m3)	=	12,406,000
		Therefore, $L(P) = 27,467$ (g/day) or	27	(kg/day)
	CL2 (Lal	ke Chivero)		
	P:	T-P concentration of lake/dam (mg/l)	=	0.01
	rw:	Rate of change of water (1/day)	=	0.002311
	sP:	Self-purification (reduction) coefficient for Phosphoru	æ	0.008675
	V:	Volume of lake (m3)	=	257,181,000
		Therefore, $L(P) = 28,254$ (g/day) or	28	(kg/day)
	CL3 (Lal	ke Manyame)		
	P;	T-P concentration of take/dam (mg/l)	=	0.01
	rw:	Rate of change of water (1/day)	=	0.000552
	sP:	Self-purification (reduction) coefficient for Phosphoru	=	0.027691
	V:	Volume of lake (m3)	=	480,236,000
		Therefore, $L(P) = 135,634$ (g/day) or	136	(kg/day)

Table 11.3.7 Allowable Polllution Load (COD, Scenario 1)

Basic formula for projection of T-P concentration: COD = L(COD)/((nw + sCOD)xV) + DCOD or L(COD) = (COD - DCOD)x((nw + sCOD)xV)COD: Concentration of COD of lake (g/m3) L(COD): Quantity of inflow COD to lake (g/day) Rate of change of water (1/day) Self-purification (reduction) coefficient for inflow COD sCOD: Volume of lake (m3) V: DCOD: Secondary production COD (mg/l) $DCOD = a(N) \times T-N \times 17.73$ a(N); Conversion rate of Nitrogen to DCOD Allowable Pollution Load in 2005: CL1 (Seke & Hatava Dams); COD: Concentration of COD of lake (g/m3) 10.00 0.015484 Rate of change of water (1/day) w: sCOD: Self-purification (reduction) coefficient for inflow COD 0.075514 12,406,000 V: Volume of lake (m3) = Conversion rate of Nitrogen to DCOD 0.8246 a(N): 5.8481 DCOD: Secondary production COD for standard T-N (0.4mg/l) 4,687 (kg/day) 4,687,212 (g/day) or Therefore, L(COD) = CL2 (Lake Chivero) 16 00 COD: Concentration of COD of lake (g/m3) = 0.002025 Rate of change of water (1/day) 0.009081 sCOD: Self-purification (reduction) coefficient for inflow COD 257,181,000 V: Volume of lake (m3) 1.0024 Conversion rate of Nitrogen to DCOD = a(N): DCOD: Secondary production COD for standard T-N (0.4mg/l) 7.1094 25,393 (kg'day) 25,392,986 (g/day) or Therefore, L(COD) = CL3 (Lake Manyame) 16.00 COD: Concentration of COD of lake (g/m3) 0.000550 Rate of change of water (1/day) rw: Self-purification (reduction) coefficient for inflow COD 0.004401 sCOD: 480.236.000 V: Volume of lake (m3) 0.4287 Conversion rate of Nitrogen to DCOD = 3.0400 DCOD: Secondary production COD for standard T-N (0.4mg/l) 30,813,086 (g/day) or 30,813 (kg/day) Therefore, L(COD) = Allowable Pollution Load in 2015: CL1 (Seke & Harava Dams); 600 COD: Concentration of COD of lake (g/m3) 0.015750 Rate of change of water (1/day) 0.075514 sCOD: Self-purification (reduction) coefficient for inflow COD 12,406,000 Volume of lake (m3) V: 0.8246 Conversion rate of Nitrogen to DCOD = a(N): DCOD: Secondary production COD for standard T-N (0.2mg/l) 2.9240 3,483 (kg/day) Therefore, L(COD) = 3,482,678 (g/day) or CL2 (Lake Chivero) COD: Concentration of COD of lake (g/m3) 6.00 0.002515 Rate of change of water (1/day) IW: sCOD: Self-purification (reduction) coefficient for inflow COD 0.009031 257,181,000 Volume of lake (m3) = V: 1.0024 Conversion rate of Nitrogen to DCOD a(N): 3.5547 DCOD: Secondary production COD for standard T-N (0.2mg/l) Therefore, L(COD) = 7,292,785 (g/day) or 7,293 (kg'day) CL3 (Lake Manyame) 6.00 COD: Concentration of COD of lake (g/m3) 0.000555 Rate of change of water (1/day) 0.004401 sCOD: Self-purification (reduction) coefficient for inflow COD 480,236,000 = Volume of take (m3) V: 0.4287 Conversion rate of Nitrogen to DCOD Ξ a(N): 1.5200 DCOD: Secondary production COD for standard T-N (0.2mg/l)

Therefore, L(COD) =

10,662,637 (g/day) or

10,663 (kg/day)

Table 11.3.8 Allowable Polllution Load (COD, Scenario 2)

Basic formula for projection of T-P concentration: COD = I(COD)/((rw+sCOD)xV) + DCOD or I(COD) = (COD-DCOD)x((rw+sCOD)xV)where: COD: Concentration of COD of lake (g/m3) I(COD): Quantity of inflow COD to lake (g/day) Rate of change of water (1/day) sCOD: Self-purification (reduction) coefficient for inflow COD Volume of lake (m3) DCOD: Secondary production COD (mg/l) $DCOD = a(N) \times T - N \times 17.73$ a(N); Conversion rate of Nitrogen to DCOD Allowable Pollution Load in 2005: CL1 (Seke & Harava Dams); COD: Concentration of COD of lake (g/m3) 10.00 0.015428 Rate of change of water (1/day) sCOD: Self-purification (reduction) coefficient for inflow COD 0.075514 12,406,000 Volume of lake (m3) V· a(N): Conversion rate of Nitrogen to DCOD 0.8246 DCOD: Secondary production COD for standard T-N (0.4mg/l) 5.8431 Therefore, L(COD) = 4,684,305 (g/day) or 4,684 (kg'day) CL2 (Lake Chivero) COD: Concentration of COD of lake (g/m3) 16.00 Rate of change of water (1/day) 0.001713 (W) sCOD: Self-purification (reduction) coefficient for inflow COD 0.009081 V: Volume of lake (m3) 257,181,000 1.0024 Conversion rate of Nitrogen to DCOD a(N): = DCOD: Secondary production COD for standard T-N (0.4mg/l) 7.1094 Therefore, L(COD) = 24,680,847 (g/day) or 24,681 (kg/day) CL3 (Lake Manyame) COD: Concentration of COD of lake (g/m3) 16.00 0.000549 Rate of change of water (1/day) CW: sCOD: Self-purification (reduction) coefficient for inflow COD 0.004401 480,236,000 V: Volume of lake (m3) a(N): Conversion rate of Nitrogen to DCOD 0.4287 DCOD: Secondary production COD for standard T-N (0.4mg/l) 3,0400 Therefore, L(COD) = 30,807,902 (g/day) or 30,808 (kg/day) Allowable Pollution Load in 2015: CL1 (Seke & Harava Dams); COD: Concentration of COD of lake (g/m3) 6.00 Rate of change of water (1/day) 0.015662 sCOD: Self-purification (reduction) coefficient for inflow COD 0.075514 Volume of lake (m3) 12,406,000 Conversion rate of Nitrogen to DCOD 0.8245 = DCOD: Secondary production COD for standard T-N (0.2mg/l) 2.9240 Therefore, L(COD) = 3,479,294 (g/day) or 3,479 (kg/day) CL2 (Lake Chivero) COD: Concentration of COD of lake (g/m3) = 6.00 Rate of change of water (1/day) 0.002311 DW" sCOD: Self-purification (reduction) coefficient for inflow COD == 0.009081 Volume of lake (m3) = 257,181,000 V: Conversion rate of Nitrogen to DCOD × 1.0024 DCOD: Secondary production COD for standard T-N (0.2mg/l) 3.5547 Therefore, L(COD) = 7,164,162 (g'day) or 7,164 (kg/day) CL3 (Lake Manyame) COD: Concentration of COD of lake (g/m3) 6.00 0.000552 Rate of change of water (1/day) = sCOD: Self-purification (reduction) coefficient for inflow COD 0.004401 480,235,000 ۷: Volume of lake (m3) = Conversion rate of Nitrogen to DCOD 0.4287 a(N): DCOD: Secondary production COD for standard T-N (0.2mg/l) 1.5200 Therefore, L(COD) = 10,656,365 (g/day) or 10,656 (kg/day)

11.4 Allowable Pollution Load and Required Pollution Load Reduction by Pollution Source

Table 11.4.1 Required Pollution Load Reduction (BOD, Domestic)

Scenario 1

Water Quality Checking Point	Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/đay)
2005				
C_{R1}	122	24	98	-73
C _{R2}	7,801	1,862	1,318	543
2015				
C _{R1}	147	29	57	-28
C_{R2}	11,244	2,403	1,708	.695

Scenario 2

Water Quality Checking Point	Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/day)
2005				
C_{R1}	76	15	98	-83
C _{R2}	7,255	1,654	1,219	435
2015				
C _{R1}	92	18	57	-39
C _{R2}	10,947	2,097	1,717	381

Table 11.4.2 Required Pollution Load Reduction (BOD, Industrial-Unsewered)

Scenario 1

Water Quality Checking Point	Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/day)
2005				
C_{R1}	0	0	0	0
C _{R2}	29	6	113	-108
2015				
C_{R1}	0	0	0	0
C_{R2}	29	6	147	-141

Scenario 2

	Concentrated		Allowable	Required Run-off
Water Quality	BOD Load	Run-off BOD	Pollution Load	Load Reduction
Checking Point	(kg/day)	Load (kg/day)	(kg/day)	(kg/day)
2005				
C _{R1}	0	0	0	0
C _{R2}	29	6	105	-99
2015				
C_{R1}	0	0	0	0
C _{R2}	29	6	148	-142

Table 11.4.3 Required Pollution Load Reduction (BOD, Livestock)

Scenario 1

Water Quality Checking Point	Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/day)
2005			and the second s	
C_{R1}	53	11	52	-41
C _{R2}	159	21	201	-180
2015		hander ender vereige afterenter Cabrin section.		The state of the s
C _{R1}	53	11	30	-20
C _{R2}	159	21	261	-240

Scenario 2

Water Quality Checking Point	Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/day)
2005				
C _{R1}	53	11	52	-41
C _{R2}	159	21	186	-165
2015			(1995年) (1995年) (1995年) (1996年)	
C_{R1}	53	11	30	-20
C _{R2}	159	21	262	-241

Table 11.4.4 Required Pollution Load Reduction (BOD, WTW)

Scenario 1

Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/day)
0	0	0	0
3	1	9	-8
0	0	0	0
7	2	12	-10
	BOD Load	BOD Load Run-off BOD	BOD Load Run-off BOD Pollution Load

Scenario 2

Water Quality Checking Point	Concentrated BOD Load (kg/day)	Run-off BOD Load (kg/day)	Allowable Pollution Load (kg/day)	Required Run-off Load Reduction (kg/day)
2005				
C_{R1}	0	0	0	0
C_{R2}	3	1	9	-8
2015	The section of the se			Service Control of Participation of Service Control
C_{R1}	0	0	0	0 .
C _{R2}	6	2	12	-10

SECTION 12 STUDY ON COUNTERMEASURES FOR WATER POLLUTION CONTROL IN THE STUDY AREA

12.2.3 Fundamentals for Design of Sewerage Facilities

Table 12.2.3.1 Design Sewage Quantity in Scenario-1 in ADWF

(Unit: m³/day)

				2000	(Ont. 1	
Authority	Sewage Works	D	Industry	2000 Commerce	Groundwater	Total
		Domestic	Industry			85,468
	Crowborough	50,871	11,392	12,057	11,148 23,502	180,179
	Firle	70,518	37,932	48,227	214	1,643
Harare	Marlborough	1,429	0	0	1,000	7,665
	Donnybrook	6,665	0	0	35,864	274,955
	Sub-Total	129,483	49,324	60,284	33,894	2/4,733
AND THE RESERVE AND THE PERSON OF THE PERSON	1. 2 3	0.040	1 522	1 0	1,722	13,203
Harare	Harare South	9,948	1,533 0	0	719	5,509
Expansion	Harare East	4,790	1,533	0	2,441	18,712
والمساعد والمساعدة والمساعد وا	Sub-Total	14,738	1,333	1	2,777	
Chitungwiza	Zengeza	29,903	1,206	1,495	4,891	37,495
					1 000	C 41.4
Norton	Norton	4,213	1,154	211	837	6,414
Ruwa	Ruwa	4,413	2,660	221	1,094	8,388
Authority	Sewage Works			2005		
	Crowborough	94,451	11,392	22,917	19,314	148,074
	Firle	86,142	37,932	91,668	32,361	248,103
Harare	Marlborough	1,429	0	0	214	1,643
Harare	Donnybrook	6,877	0	0	1,032	7,909
	Sub-Total	188,899	49,324	114,584	52,921	405,729
Harare	Harare South	15,781	39,533	0	8,297	63,611
Expansion	Harare East	5,459	0	0	819	6,278
Dispariorers	Sub-Total	21,240	39,533	0	9,116	69,889
Chitungwiza	Zengeza	30,752	1,401	1,538	5,054	38,744
Norton	Norton	7,054	3,386	353	1,619	12,412
					T	12.102
Ruwa	Ruwa	7,541	3,545	377	1,719	13,183
Authority	Sewage Works			2015		
, , , , , , , , , , , , , , , , , , , ,	Crowborough	111,514	11,392	32,697	23,340	178,944
	Firle	96,765	41,762	130,789	40,397	309,713
Harare	Marlborough	4,184	0	0	628	4,812
	Donnybrook	10,710	0	0	1,607	12,317
	Sub-Total	223,173	53,154	163,486	65,972	505,785
	Hanna On at	10 610	39,533	T 0	12,012	92,093
Нагаге	Harare South	40,548	25,642	0	4,908	37,629
Expansion	Harare East	7,079	65,175	0	16,920	129,722
	Sub-Total	47,627	1 05,175	-L	1	
Old an ending	700000	45,953	12,764	2,298	9,152	70,167
Chitungwiza	Zengeza	43,333	1 12,707	1		<u> </u>
N/a -4	Norton	17,023	18,042	851	5,387	41,304
Norton	Monon	11,043	10,072		سسيد والمستحدث فالمستحد المستحد	L
Ruwa	Ruwa	10,807	4,632	540	2,397	18,376

Table 12.2.3.2 Design Sewage Quantity in Scenario-2 in ADWF

(Unit: m³/day)

Authority	Sewage Works			2000	(one.)	
Zumorny	comage mones	Domestic	Industry	Commerce	Groundwater	Total
	Crowborough	50,866	11,392	11,515	11,066	84,839
	Firle	75,763	37,932	46,061	23,963	183,720
Harare	Marlborough	1,518	0	0	228	1,746
Halaic	Donnybrook	6,171	0	0	926	7,097
	Sub-Total	134,318	49,324	57,577	36,183	277,402
AND THE RESERVE THE PARTY OF TH	J Sub-Potat 1	134,310	173521			
Harare	Harare South	1,551	1,533	0	463	3,547
Expansion	Harare Bast	4,790	0	0	719	5,509
25.15.201.01.01	Sub-Total	6,341	1,533	0	1,181	9,055
Chitungwiza	Zengeza	36,573	1,206	1,829	5,941	45,549
		2055		102	497	3,810
Norton	Norton	2,056	1,154	103	1 497 1	3,010
**	To	156	2,660	8	424	3,247
Ruwa	Ruwa	156	2,000	2005	127	J,LT/
Authority	Sewage Works				10.006	02.720
	Crowborough	54,992	11,392	14,251	12,095	92,730
	Firle	83,597	37,932	57,003	26,780	205,312
Harare	Marlborough	1,747	0	0	262	2,009
	Donnybrook	7,327	0	0	1,099	8,426
	Sub-Total	147,663	49,324	71,254	40,236	303,477
				T	(150	47.140
Harare	Harare South	1,465	39,533	0	6,150	47,148
Expansion	Harare East	5,459	0	0	819	6,278
	Sub-Total	6,924	39,533	0	6,969	53,426
		16.703	1 201	2,339	7,578	58,099
Chitungwiza	Zengeza	46,781	1,401	2,339	1,576	30,022
Madan	Norton	3,092	3,386	155	995	7,627
Norton	Inouon	J,072	3,300	1	1	
Ruwa	Ruwa	208	3,545	10	565	4,328
Authority	Sewage Works			2015		
	Crowborough	74,250	11,392	22,334	16,196	124,172
	Firle	110,544	41,762	89,335	36,246	277,887
Harare	Marlborough	2,261	0	0	339	2,600
Halaic	Donnybrook	10,215	0	0	1,532	11,747
	Sub-Total	197,270	53,154	111,668	54,314	416,406
	1 000-1001	1713270	1			
Harare	Harare South	1,679	39,533	0	6,182	47,394
Expansion	Harare East	7,079	25,642	0	4,908	37,629
эмранятон	Sub-Total	8,758	65,175	0	11,090	85,023
			*			
Chitungwiza	Zengeza	76,996	12,764	3,850	14,041	107,651
Norton	Norton	4,744	18,042	237	3,453	26,477
Ruwa	Ruwa	278	4,632	14	739	5,662

|--|

				2000	
Authority	Sewage Works	Land Use	Pupulation	Unti Quantity	Design Sewage
]		<u>-</u>	,	Quantity
			(persons)	(l/capita/day)	(m³/day)
		Low Density	52,296	315	16,473
		Medium Density	35,280	210	7,409
		High Density	423,000	63	26,649
	Crowborough	Low/Medium Density	0	263	0
	Ĭ	Medium/High Density	0	137	0
	ł	High Density High Income	1,620	210	340
		Total	512,196	-	50,871
Harare		Low Density	42,636	315	13,430
		Medium Density	53,280	210	11,189
	Firle	High Density	561,200	63	35,356
		Low/Medium Density	4,286	263	1,127
1		Medium/High Density	52,451	137	7,186
		High Density High Income	10,620	210	2,230
		Total	724,473		70,518
	Marlborough	Low Density	4,536	315	1,429
	Donnybrook	High Density	105,800	63	6,665
					r
]		Low Density	3,960	315	1,247
	Harare South	Medium Density	20,610	210	4,328
Harare	rare	High Density	69,400	63	4,372
Expansion		'Total	93,970	-	9,948
			Mr. 5 - 5		4 500
	Harare East	Epworth (High Density)	76,028	63	4,790
	T	I am Danitu		315	0
	g	Low Density	0 15,075	210	3,166
Chitungwiza	Chitungwiza Zengeza	Medium Density		63	26,737
		High Density	424,400	UJ	29,903
	<u></u>	Total	439,475		27,703
		Low Density	3,504	315	1,104
Norton	Norton	Medium Density	900	210	189
1.011011		High Density	46,350	63	2,920
		Total	50,754	-	4,213
	4				
	1	Low Density	4,668	315	1,470
Ruwa	Ruwa	Medium Density	810	210	170
	}	High Density	44,010	63	2,773
		Total	49,488		4,413

(cont'd)
Table 12.2.3.3 (2) Design Domestic Sewage Quantity in ADWF (Scenario-1)

				2005	
Authority	Sewage Works	Land Use	Pupulation	Unti Quantity	Design Sewage Quantity
		ĺ	(persons)	(l/capita/day)	(m³/day)
		Low Density	52,296	315	16,473
		Medium Density	86,940	210	18,257
		High Density	863,000	65	56,095
	Crowborough	Low/Medium Density	12,493	263	3,286
		Medium/High Density	0	138	0
		High Density High Income	1,620	210	340
		Total	1,016,349	-	94,451
Ì					
Нагаге		Low Density	43,728	315	13,774
		Medium Density	59,040	210	12,398
		High Density	759,600	65	49,374
	Firle	Low/Medium Density	4,286	263	1,127
11110	Medium/High Density	52,451	138	7,238	
		High Density High Income	10,620	210	2,230
		Total	929,725	•	86,142
			_		
	Marlborough	Low Density	4,536	315	1,429
	Donnybrook	High Density	105,800	65	6,877

		Low Density	3,960	315	1,247
	Harare South	Medium Density	20,610	210	4,328
Harare		High Density	157,000	65	10,205
Expansion		Total	181,570		15,781
				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
	Harare East	Epworth (High Density)	83,983	65	5,459
				T*************************************	
O) '		Low Density	0	315	0
Chitungwiza	Zengeza	Medium Density	15,075	210	3,166
	High Density	424,400	65	27,586	
		Total	439,475	<u> </u>	30,752
	A management of the party of the first of th	Low Docity	6 869	715	0.027
Norton	Norton	Low Density	6,468	315	2,037
MOHON	ROROR	Medium Density High Density	9,540	210	2,003
		Total	46,350	65	3,013
		10(3)	62,358		7,054
		Low Density	11 220	215	1560
Ruwa	Ruwa	Medium Density	11,328	315	3,568
Nuwa	Nuwa		810	210	170
	i	High Density Total	58,500	65	3,803
		Total	70,638	<u> </u>	7,541

(cont'd)
Table 12.2.3.3 (3) Design Domestic Sewage Quantity in ADWF (Scenario-1)

				2015	
Authority	Sewage Works	Land Use	Pupulation	Unti Quantity	Design Sewage
Additionly	Seringe Horks	1,2,1,0	- •	•	Quantity
			(	(l/capita/day)	(m³/day)
			(persons)		
		Low Density	52,296	315	16,473
		Medium Density	86,940	210	18,257
		High Density	972,600	70	68,082
j	Crowborough	Low/Medium Density	25,007	263	6,577
1		Medium/High Density	12,742	140	1,784
		High Density High Income	1,620	210	340
		Total	1,151,205	-	111,514
					14,200
Harare		Low Density	45,684	315	14,390
	Medium Density	59,040	210	12,398	
		High Density	846,800	70	59,276
	Pirle	Low/Medium Density	4,286	263	1,127
		Medium/High Density	52,451	140	7,343
		High Density High Income	10,620	210	2,230
		Total	1,018,881	_	96,765
	THE PARTY OF THE P				
	Marlborough	Low Density	13,284	315	4,184
	Donnybrook	High Density	153,000	70	10,710
	<u> </u>				
		Low Density	3,960	315	1,247
	Harare South	Medium Density	20,610	210	4,328
Harare	Harare	High Density	499,600	70	34,972
Expansion		Total	524,170		40,548
p					
	Harare East	Epworth (High Density)	101,126	70	7,079
		Low Density	2,568	315	809
Chitungwiza	Zengeza	Medium Density	37,170	210	7,806
	SS.	High Density	533,400	70	37,338
		Total	573,138		45,953
	<u> </u>				
	ſ	Low Density	21,540	315	6,785
Norton	Norton	Medium Density	24,750	210	5,198
	1	High Density	72,000	70	5,040
		Total	118,290		17,023
* <del>* * * * * * * * * * * * * * * * * * </del>					·
		Low Density	11,328	315	3,568
Ruwa	Ruwa	Medium Density	11,970	210	2,514
		High Density	67,500	70	4,725
		Total	90,798	•	10,807

Table 12.2.3.4 Design Domestic Sewage Quantity in ADWF (scenario-2)

12000   2005   2015   2000   2005   2015   2000   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005   2005	Authority	Sewage		Population (person)		Unit Do	Unit Domestic Sewage Quantity (1/capita/day)	Quantity	Design	Design Domestic Sewage Quantity (m3/day)	Quantity
Crowborough         513.799         591.309         765.459         99         99         93         97         50.866         54.992           Firle         781.060         898.888         1.163.625         97         93         95         75.763         83.597           Marlborough         4.819         5.546         7.179         315         315         1.518         1.747           Donnybrook         97.950         112.726         145,926         6.3         6.3         6.         70         6.171         7.327           Sub-Total         1.397,628         1.608,469         2.082,189         -         -         134,318         1.745         1.465           Harme South         14,633         16.841         2.1801         106         87         77         1.531         1.465           Harme South         14,633         10.1.256         63         65         70         4,790         5,459           Tharme East         76,028         83,982         101,126         63         65         70         4,790         5,459           Sub-Total         20,661         100,823         122,257         -         -         6,341         6,524			2000	2005	2015	2000	2005	2015	2000	2005	2015
First         761,060         898,888         1,163,625         97         93         95         75,763         83,597           Martborough         4,819         5,546         7,179         315         315         1,518         1,747           Donnybrook         97,950         112,726         145,926         63         65         70         6,171         7,327           Sub-Toral         1,397,628         1,608,469         2,082,189         -         -         134,318         1,745           Harare South         1,4633         1,608,469         2,082,189         -         -         134,318         1,465           Harare South         1,6028         83,982         101,126         63         65         70         4,790         5,459           Sub-Toral         90,661         100,823         122,927         -         -         6341         6,924           Sub-Toral         90,661         100,823         122,927         -         -         6,241         6,924           Sub-Toral         90,661         1,000,823         122,297         -         -         6,241         6,924           Norton         24,770         27,362         32,927         8		Crowborough	513,799	591,309	765,459	66	93	62	50.866	54,992	74,250
Marlborough         4,819         5,546         7,179         315         315         315         1,518         1,747           Donnybrook         97,950         112,726         145,926         63         65         70         6,171         7,327           Sub-Total         1,397,628         1,608,469         2,082,189         -         -         -         134,318         147,663           Harare South         14,633         16,841         21,801         106         87         77         1,551         1,465           Harare East         76,028         83,982         101,126         63         65         70         4,790         5,459           Sub-Total         90,661         100,823         122,927         -         -         6,341         6,524           Norton         24,770         27,362         82         70         4,790         5,459           Ruwa         1,757         1,940         2,356         89         107         119         156         204,687		Firle	781,060	898,888	1,163,625	26	93	95	75,763	83.597	110.544
Sub-Total         1.397,628         1.608,469         2.082,189         -         -         1.34,318         1.47,663           Harare South         14,633         1,608,469         2.082,189         -         -         134,318         147,663           Harare South         14,633         16,841         21,801         106         87         77         1,551         1,465           Harare East         76,028         83,982         101,126         63         65         70         4,790         5,459           Sub-Total         90,661         100,823         122,927         -         -         6,341         6,924           Norton         24,770         27,362         82,354         83         113         144         2,056         3,092           Ruwa         1,757         1,940         2,336         89         107         119         156         208           Ruma         2,052,640         2,406,898         3,202,855         -         -         179,443         204,667	Harare	Marlborough	4,819	5,546	7,179	315	315	315	1,518	1,747	2,261
Sub-Total         1,397,628         1,608,469         2,082,189         -         -         154,318         147,663         147,663         147,663         147,663         147,663         147,663         147,663         147,663         147,663         147,663         1465         147,663         147,663         147,663         147,663         147,663         147,663         147,663         1465         147,663         147,663         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79         147,79		Donnybrook	97,950	112.726	145,926	63	65	70	6,171	7,327	10,215
Harare South         14,633         16,841         21.801         106         87         77         1,551         1,465           Harare East         76,028         83,982         101,126         63         63         70         4,790         5,459           Sub-Total         90,661         100,823         122,927         -         -         6,341         6,924           Zengeza         537,824         668,304         962,456         68         70         80         36,572         46,781           Norton         24,770         27,362         32,947         83         113         144         2,056         3,092           Ruwa         1,757         1,940         2,336         89         107         119         156         208           otal         2,052,640         2,406,898         3,202,855         -         -         179,443         204,667	ļ	Sub-Total	1,397,628	1,608,469	2,082,189	í		,	134,318	147,663	197.270
Harare East         76.028         83.982         101.126         63         63         70         4.790         5.459           Sub-Total         90.661         100.823         122.927         -         -         -         6.341         6.924           Zengeza         537.824         668.304         962,456         68         70         80         36.572         46.781           Norton         24,770         27.362         32.947         83         113         144         2.056         3.092           Ruwa         1,757         1,940         2.336         89         107         119         156         208           Otal         2.052.640         2,406.898         3,202.855         -         -         -         179.443         204.667		Harare South	14,633	16,841	21.801	106	87	77	1,551	1,465	1.679
Sub-Total         90,661         100,823         122,927         -         -         -         6,341         6,924                     Zengeza         537,824         668,304         962,456         68         70         80         36,572         46,781                     Norton         24,770         27,362         32,947         83         113         144         2,056         3,092                     Ruwa         1,757         1,940         2,336         89         107         119         156         208                     otal         2,052,640         2,406,898         3,202,855         -         -         -         179,443         204,667	Harare Expansion	Harare East	76.028	83,982	101.126	63	99	70	4,790	5,459	7,079
Zengeza         537,824         668,304         962,456         68         70         80         36,572         46.781         1           Norton         24,770         27,362         32,947         83         113         144         2,056         3,092         1           Ruwa         1,757         1,940         2,336         89         107         119         156         208         1           otal         2,052,640         2,406,898         3,202,855         -         -         179,443         204,667         1		Sub-Total	90,661	100,823	122.927		,		6.341	6,924	8,757
Norton         24,770         27,362         32,947         83         113         144         2,056         3,092         3,092           Total         1,757         1,940         2,336         89         107         119         156         208           Total         2,052,640         2,406,898         3,202,855         -         -         179,443         204,667	hitungwiza		537,824	668,304	962,456	89	70	80	36,572	46.781	76,996
Ruwa         1.757         1,940         2,336         89         107         119         156         208           Total         2,052,640         2,406,898         3,202,855         -         -         179,443         204,667	Norton	Norton	24,770	27,362	32,947	83	113	144	2.056	3,092	4,744
2,052,640 2,406,898 3,202,855 179,443 204,667	Ruwa	Ruwa	1,757	1,940	2,336	88	107	119	156	208	278
	F1	Cotal	2,052,640	2,406.898	3,202,855		,		179,443	204,667	288.046



I				2000	
Authority	Sewage Works	Land Use	Pupulation in	Unti Quantity	Unit Quantity in
	Ü		Scenario 1		Scenario-2
			(persons)	(l/capita/day)	(l/capita/day)
		Low Density	52,296	315	
		Medium Density	35,280	210	]
		High Density	423,000	63	}
	Crowborough	Low/Medium Density	0	263	99
ļ	3	Medium/High Density	0	137	]
		High Density High Income	1,620	210	}
		Total	512,196		<u> </u>
Harare		Low Density	42,636	315	]
		Medium Density	53,280	210	
		High Density	561,200	63	
	Firle	Low/Medium Density	4,286	263	97
		Medium/High Density	52,451	137	_
		High Density High Income	10,620	210	_
		Total	724,473		
				-	
	Marlborough	Low Density	4,536	315	315
	Donnybrook	High Density	105,800	63	63
		Low Density	3,960	315	1,00
	Harare South	Medium Density	20,610	210	106
Harare		High Density	69,400	63	-
Expansion		Total	93,970		<u></u>
				T	63
	Harare East	Epworth (High Density)	76,028	63	L 03
		Iz D	0	315	1
		Low Density	15,075	210	68
Chitungwiza	Zengeza	Medium Density	424,400	63	1 "
	High Density Total	439,475		1	
	<u> </u>	10(8)	435,413	J	_L
	<u> </u>	Low Density	3,504	315	
Mastas	Norton	Medium Density	900	210	83
Norton	INDITION	High Density	46,350	63	1
		Total	50,754	<del> </del>	
	<u> </u>	10101	1	<u>. L </u>	
	<u> </u>	Low Density	4,668	315	
Ruwa	Ruwa	Medium Density	810	210	89
Nuwa	I.una	High Density	44,010	63	
		Total	49,488	•	7

Table 12.2.3.5 (2) Unit Domestic Sewage Quantity in Scenario-2 (cont'd)

				2005	
Authority	Sewage Works	Land Use	Pupulation in	Unti Quantity	Unit Quantity in
			Scenario 1	FA-A-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	Scenario-2
			(persons)	(l/capita/day)	(l/capita/day)
		Low Density	52,296	315	
		Medium Density	86,940	210	]
		High Density	863,000	65	]
	Crowborough	Low/Medium Density	12,493	263	93
		Medium/High Density	0	138	
1		High Density High Income	1,620	210	j
		Total	1,016,349		
Harare		Low Density	43,728	315	
		Medium Density	59,040	210	
		High Density	759,600	65	
	Firle	Low/Medium Density	4,286	263	93
		Medium/High Density	52,451	138	
	·	High Density High Income	10,620	210	
		Total	929,725	•	<u> </u>
j .					245
i	Marlborough	Low Density	4,536	315	315
}	Donnybrook	High Dessite	105,800	65	65
}	Donnyorook	migh Density	103,600	00	1 03
<u> </u>		Low Density	3,960	315	
	Harare South	Medium Density	20,610	210	87
Harare		High Density	157,000	65	1
Expansion		Total	181,570	•	1
_					
	Harare East	Epworth (High Density)	83,983	65	65
		t an Danitu	0	316	T
Chituanuina	7.00000	Low Density		315 210	70
Chitungwiza	Zengeza	Medium Density	15,075 424,400		70
		High Density Total	439,475	65	
		POLAT	439,473	-	L
		Low Density	6,468	315	<u> </u>
Norton	Norton	Medium Density	9,540	210	113
		High Density	46,350	65	
		Total	62,358	-	
		Low Density	11,328	315	
Ruwa	Ruwa	Medium Density	810	210	107
		High Density	58,500	65	
<u> </u>		Total	70,638	-	



			Amerika ya ngangan ya manda Kandada ngangan dan na pinda Mada Mandada da Mandada ya mandan da Mandada Na Nanyandan Mandada Mandada Na Nanyandan Mandada Mandada Mandada Manda Mandada da Mandada ya mandada	2015	
Authority	Sewage Works	Land Use	Pupulation in	Unti Quantity	Unit Quantity in
Additionity	Dewage werns		Scenario 1		Scenario-2
			(persons)	(l/capita/day)	(l/capita/day)
	The state of the s	Low Density	52,296	315	
		Medium Density	86,940	210	
		High Density	972,600	70	]
	Crowborough	Low/Medium Density	25,007	263	97
	3.0	Medium/High Density	12,742	140	]
		High Density High Income	1,620	210	
		Total	1,151,205		<u> </u>
Harare		Low Density	45,684	315	<u> </u>
- B		Medium Density	59,040	210	
		High Density	846,800	70	]
	Firle	Low/Medium Density	4,286	263	95
		Medium/High Density	52,451	140	}
	Ì	High Density High Income	10,620	210	
		Total	1,018,881		
		The second secon			
	Marlborough	Low Density	13,284	315	315
	Donnybrook	High Density	153,000	70	70
		Low Density	3,960	315	_
	Harare South	Medium Density	20,610	210	77
Harare		High Density	499,600	70	
Expansion	1	Total	524,170	-	<u>                                     </u>
Emparioren					
	Harare East	Epworth (High Density)	101,126	70	70
					·
		Low Density	2,568	315	
Chitungwiza	Zengeza	Medium Density	37,170	210	80
<b>D</b>		High Density	533,400	70	4
		Total	573,138	<u> </u>	<u> L</u>
	T	Low Density	21,540	315	
Norton	Norton	Medium Density	24,750	210	144
		High Density	72,000	70	_[
		Total	118,290		<u></u>
	<u></u>				T
		Low Density	11,328	315	
Ruwa	Ruwa	Medium Density	11,970	210	119
1132		High Density	67,500	70	_
ł		Total	90,798	<u> </u>	

Table 12.2.3.6 Design Served Population by Sewage Works

Authority	Sewage Works	s Land Use		Land Use Area (km²)	ر. ا		Population	
			2000	2005	2015	2000	2005	2015
		Low Density	43.58	43.58	43.58	52,296	52,296	52,296
		Medium Density	7.84	19,32	19.32	35,280	86,940	86,940
	,	High Density	21.15	43.15	48.63	423,000	863,000	972,600
	Crowborough	Low/Medium Mixed Density	00:0	5.83	11.67	0	12,493	25,007
		Medium/High Mixed Density	00.0	00:0	1,46	0	0	12,742
		High Density High Income	0.36	98.0	0.36	1,620	1,620	1,620
		Total	72.93	112.24	125.02	512,196	1,016,349	1,151,205
		(You Describe	35 53	36.44	38.07	42,636	82 728	45 684
		Medium Density	28.11	12.12	13.12	036.55	OPCION	190
		High Descrite	20.20	27.0%	47.74	561,200	750 600	200, 472
H. mas	11	Tow/Mading Mixed Descin	200	80,	200	4.7%	4 286	7367
3 4 4 4	3 T	TOTAL MANAGEMENT OF THE PARTY O	3,4	2000	200	2000	2007	007
		אפסוחה/ הוצה ואואסט ואפונא	9.01	10.0	9.0	22,431	32,431	52,451
		Total	85.80 08.80	97.91	103.90	724,473	929,725	1.018.881
	Marlborough	Low Density	3.78	3.7%	11.07	4,536	4,536	13,284
	Donnybrook	High Density	5.29	5.29	7.65	105,800	105,800	153,000
		Low Density	3.30	3.30	3.30	3,960	3,960	3,960
	Harare South	Medium Density	4.58	4.58	4.58	20,610	20,610	20,610
Harare		High Density	3,47	7.85	24,98	69,400	157,000	499,600
Expansion		Total	11.35	15.73	32.86	93,970	181,570	524,170
	Harare East	Epworth (High Density)	E.	•	*	76,028	83,983	101,126
		Low Density	0.00	0.00	2.14	0	0	2,568
itungwiza	Chirungwiza Zengeza	Medium Density	3.35	3,35	8.26	15,075	15,075	37,170
		High Density	21.22	21.22	26.67	424,400	424,400	533,400
		Total	24.57	24.57	37,07	439,475	439,475	573,138
		Low Density	2.92	5,39	17.95	3.504	6.468	21.540
Norton	Norton	Medium Density	0.20	2.12	5.50	8	9,540	24.750
		High Density	5.15	5.15	8.00	46,350	46,350	72,000
		Total	8.27	12.66	31.45	50,754	62,358	118,290
	····	Low Density	3.89	9.44	9.44	4,668	11,328	11,328
Ruwa	Ruwa	Medium Density	0.18	0.18	2.66	810	810	17,970
		High Density	4.89	6.50	7.50	44,010	58,500	67,500
ŀ		Total	8.96	16.12	19.60	49,488	70,638	86,798

Table 12.2.3.7 Design Served Population by Sewage Works

(Scenario-2)

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8

Authority	Sewage Works	1992/1993	2000	2005	2015
	Crowborough	413,573	513,799	591,309	765,459
	Firle	628,700	781,060	888,888	1,163,625
Harare	Mariborough	3,879	4,819	5,546	7,179
	Donnybrook	78,843	97,950	112,726	145,926
	Sub-Total	1,124,995	1,397,627	1,608,470	2,082,189
	Harare South	11,498	14,633	16,841	21,801
Harare					
Expansion	Harare East	62,630	76.028	83,982	101,126
	Sub-Total	74,128	90,662	100,823	122,927
Chitungwiza	Zengeza	354,541	537,824	668.304	962,456
					76000 A A A A A A A A A A A A A A A A A A
Norton	Norton	20,405	24.770	27,362	32,947
Ruwa	Ruwa	1,447	1,757	1,940	2,336
T	Total	1.575,516	2,052,639	2,406,899	3,202,855

Note: Base year; 1993 for Harare and 1992 for other authorities Population growth rate; Refer to Case 3 in Section 6.2.3

Table 12.2.3.8 Area by Sewage Treatment Works and Suburban in Harare in 1993

	Suburban Name			Área (km²)		
		Crowborough	Firle	Marlborough	Donnybrook	Total
1	Marimba Park	2.35				2.35
2	Haffield		22.20			22.20
3	Waterfalls		28.14			28.14
4	Milton Park	3.83				3.83
5	Avondale	13.09				13.09
6	Borrowdale					0.00
7	Kuwadzana	10.10				10.10
8	Alexandra Park	5.84				5.84
9	Warren Park	17.94				17.94
10	Mufakose	14.03				14.03
11	Rugare	1.44				1.44
12	Budiriro		18.65			18.65
13	Glen View		7.45			7.45
14	Glen Norah		8.43			8.48
15	Highfields		8.24			8.24
16	Mbare		10.09			10.09
17	Mavuku				7.17	7.17
18	Gunhill		9.38			9.38
19	Belgravia	3.87	0.99			4.86
20	Ridgeview	4.00				4.00
21	Hatcliffe					0.00
22	Queensdale		2.67			2.67
23	Cranborne		2.72			2.72
24	Sunningdale		5.13			5.13
25	Eastlea		5.94			5.94
26	Belvedere	10.36				10.36
27	Mt. Pleasant	0.50				0.50
28	Highlands					0.00
29	Marlborough	0.69		3.78		4,47
30	Mabelreign	19.60	· · · · · · · · · · · · · · · · · · ·			19.60
31	City Centre		6.37		·	6.37
32	Tafara				9.73	9.73
33	Kambuzuma	4.82				4.82
34	Southerton	8.55	15.09			23.64
35	Dzivaresekwa	7.88				7.88
36	Hillside		2.62			2.62
37	Braeside		2.08			2.08
38	Tynwald	21.45				21.45
39	Greendale		13.96			13.96
40	Westwood	1.66				1.66
41	Arcadia		4.44			4.44
42	Chikurubi					0.00
43	Cleveland Dam					0.00
44	Mukuvisi W'lands		3.13			3.13
	Total	152.00	177.77	3.78	16.90	350.45

Note: 0.00; Area of septic tank using and open spaces or outside of study area

Table 12.2.3.9 Population by Sewage Treatment Works and Suburban in Harare in 1993

Ĩ

	Suburban Name			Population		
		Crowborough	Firle	Marlborough	Donnybrook	Total
1	Marimba Park	7,667				7,667
2	Haffield		30,590			30,590
3	Waterfalls		34,412			34,412
4	Milton Park	3,824				3,824
5	Avondale	16,569				16,569
6	Borrowdale					0
7	Kuwadzana	75,200				75,200
8	Alexandra Park	2,549				2,549
9	Warren Park	68,827				68,827
10	Mufakose	95,593				95,593
11	Rugare	8,922	AND DESCRIPTION OF THE PARTY OF			8,922
12	Budiriro		65,003			65,003
13	Glen View	<u> </u>	137,654			137,654
14	Glen Norah		63,729			63,729
15	Highfields		85,396			85,396
16	Mbare		107,064			107,064
17	Mavuku				47,159	47,159
18	Gunhill		2,950			2,950
19	Belgravia	2,030	519			2,549
20	Ridgeview	1,275				1,275
21	Hatcliffe	1,510				0
$\frac{21}{22}$	Queensdale		6,373			6,373
23	Cranborne	-	10,197			10,197
24	Sunningdale		7,647			7,647
25	Eastlea		8,923			8,923
26	Belvedere	11,471				11,471
27	Mt. Pleasant	680	<u></u>			680
28	Highlands					0
<del>20</del> 29	Marlborough	708		3,879		4,587
30	Mabelreign	27,558				27,558
	City Centre	27,050	36,963			36,963
31	Tafara		30,703		31,684	31,684
33	Kambuzuma	34,413				34,413
	The same of the sa	2,766	4,881			7,647
34	Southerton Dzivaresekwa	44,599	7,001			44,599
35	Hillside	74,377	3,840			3,840
36			5,098			5,098
37	Braeside Transold	7,647	3,070			7,647
38	Tynwald	1,047	14,912			14,912
39	Greendale	1,275	17,716			1,275
40	Westwood	1,2/3	2,549			2,549
41	Arcadia		Δ ₃ 343			0
42	Chikurubi					0
43	Cleveland Dam	<del>  </del>	0			0
44	Mukuvisi W'lands	<del></del>				
	Total	413,573	628,700	3,879	78,843	1,124,995

Note: 0.00; Population of septic tank using and open spaces or outside of study area

Sewerage and Septic Tank Service Area by Suburban and Sub-Basin in Harare in 1993 Table 12.2.3.10 (1)

	Total		2.35	22.20	28.14	3.83	13.09	7.97	10.10	5.84	17.94	14.03	1.44	18.65	7.45	8.48	8.24	10.09	7.17	12.16	4.86	4.00	1.17	2.67	2.72	5.13	5.94	10.36	24.37	12.77	19.87
		Septic																													
	Ruwa	Sewerage											j						7.17												
	isi	Septic							•								Í													69.6	
	Mukuvisi	Sewerage		22.20	28.14										7.45	8.48	8.24	10.09		6.53	0.99			2.67	2.72	5.13	5.94				
Area (km²)	ba	Septic										-	****				-						***								
A	Marimba	Sewerage	2.35			3.83	10.90		10.10	5.37	17.94	14.03	1.44	7.45 %7	··						3.87	4.00						10.36			
	Chivero	Septic																													
	Lake Chi	Sewerage												11.20 *6																	
		Septic					-	7.97	-•											2.78		<b></b> -	1.17			-			23.87	3.08	15.40
	Gwebi	Sewerage					2.19 *1			0.47 *2(			. :							2.85 *3									0.50 *4		4.47 *5
Suburban Name			Marimba Park	Haffield	Waterfalls	Milton Park	Avondale	Borrowdale	Kuwadzana	Alexandra Park	Warren Park	Mufakose	Rugare	Budiriro	Glen View	Glen Norah	Highfields	Mbare	Mavuku	Gunhill	Belgravia	Ridgeview	Hatcliffe	Oueensdale	Cranborne	Sunningdale	Eastlea	Belvedere	Mt. Pleasant	Highlands	Marlborough
S			-1	2	т	4	S		7	တ	6	10	11	22	13	14	15	16	17	9 1	16					24	22		27	7	29

Table 12.2.3.10 (2) Sewerage and Septic Tank Service Area by Suburban and Sub-Basin in Harare in 1993 (cont'd)

0

Suburban Name	d2				7	Area (km²)					
	Gwebi	ebi	Lake Ch	Chivero	Marimba	pqı	Mukuvisi	'isi	Ruwa	62	Total
-	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	
30 Mabelreign		1.25			19.60						20.85
ŀ							6.37				6.37
Π									9.73		9.73
1					4.82						4.82
T					8.55		15.09				23.64
	8				7.88						7.88
Г							2.62				2.62
1							2.08				2.08
4					21.45						21.45
1				-			13.96	11.79			25.75
40 Westwood					1.66						1.66
1						1	4.44				4.44
Ι								2.50			2.50
	am							17.15			17.15
44 Mukuvisi Wlands	Tands						3.13				3.13
Sub-Total	10.48	55.52	11.20	00.00	155.60	0.00	156.27	41.13	16.90	00.00	447.10
TA*3	1 [	00 99	11.2	1.20	155.60	09	197.40	\$	16.90	0	447.10
L OLD	3	3	7.77	3	****	2		9			

Pumped to Marimba Sub-Basin 4464466

Pumped to Marimba Sub-Basin

Pumped to Mukuvisi Sub-Basin

0.69 km² pumped to Marimba Sub-Basin Pumped to Marimba Sub-Basin

Pumped to Mukuvisi Sub-Basin Pumped to Mukuvisi Sub-Basin

Total Area of Using the Septic Tank and Open Spaces in Study Area in Harare City in 1993: Total Area of Using the Sewerage Systems in Study Area in Harare City in 1993:

ĘĘ 350.45

Table 12.2.3.11 (1) Sewerage and Septic Tank Service Population by Suburban and Sub-Basin in Harare in 1993

	Total		7.667	30,590	34,412	3.824	16,569	3,630	75.200	2.549	68.827	95.593	8.922	65.003	137,654	63.729	85,396	107.064	47,159	3,824	2.549	1.275	5,098	6.373	10,197	7.647	8.923	11,471	33,139	16,906	20,393
	Ruwa	Septic															-	-	1												
	к	Sewerage																	47,159			••									
	visi	Septic																		-										12,828	
	Mukuvisi	Sewerage		30,590	34,412										137,654	63,729	85,396	107.064		2,054	519			6,373	10.197	7.647	8.923				
Population	aba	Septic																							-						
	Marimba	Sewerage	7,667			3,824	13,797		75,200	2,344	68,827	95,593	8,922	65,003 *6							2,030	1,275						11,471			
	Chivero	Septic																													
	Lake Ch	Sewerage				:								0																	
	ic	Septic						3,630												874			5,098						32,459	4,078	15.806
	Gwebi	Sewerage					2,772 *1			205 *2										896									680 *4		4,587 *5
Suburban Name			Marimba Park	Haffield	Waterfalls	Milton Park	Avondale	Воттоwdale	Kuwadzana	Alexandra Park	Warren Park	Mufakose	Rugare	Budiriro	Glen View	Glen Norah	Highfields	Mbare	Mavuku	Gunhill	Belgravia	Ridgeview	Hatcliffe	Oueensdale	Cranborne	Sunningdale	Eastlea	Belvedere	Mt. Pleasant	Highlands	Marlborough
S				2		4	5	9	7	8	6	ខ្ព	11	12	13	14	15	16	17	18	19	20	21		23	24		26			29

Table 12.2.3.11 (2) Sewerage and Septic Tank Service Population by Suburban and Sub-Basin in Harare in 1993 (cont'd)

Į.

	Lucker Nome						Population					
) )	Subur Dan Lyamo	Gwehi	7.5	Lake Ch	Chivero	Marimba	pa	Mukuvisi	visi	Ruwa	8	Total
		Sewerace	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	
6	Mohalvaim		1 757			27.558						29,315
	Marcher Kin							36,963				36,963
7 6	Tofam									31.684		31.684
	A a late a					34,413						34,413
3 2	Southerton					2.766		4,881				7.647
	Designation					44.599						44.599
	Delvalence							3.840				3,840
	rimside o							\$ 008				5.098
	Diacside					7 647						7.647
	) www.			į		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		12 912	12.594			27.506
7	Greendale							7.4.4				1 275
<del>2</del>	Westwood					1,275						0,50
14	Arcadia							2,549				2,349
7	Chikumbi								0			0
43	Cleveland Dam								0			0
1	Mukuvisi Wlands							0				0
									,	0.00	,	. 011,110
	Sub-Total	9.140	63.702	0	0	474,211	0	562,801	25,422	78,843	0	1.214,119
												1 011 110
	Total	72,842	42	_		474.211	211	588,223	223	/8,843	4.5	1.614.113

Pumped to Marimba Sub-Basin - 4 0 4 v δ

Pumped to Marimba Sub-Basin

Pumped to Mukuvisi Sub-Basin

0.69 km² pumped to Marimba Sub-Basin Pumped to Marimba Sub-Basin

Pumped to Mukuvisi Sub-Basin

Total Population of Using the Sewerage Systems in Study Area in Harare City in 1993: Total Population of Using the Septic Tank in Study Area in Harare City in 1993:

89,124 1,124,995

12-2-3-17

Table 12.2.3.12 (1) Land Use Area by Sub-Basin and Sewerage/Septic Tank Using

									(# CF XEE 2007)	/
	Sub-Basin and Authority	Land Use				Land Use Area (km ² )	Area (km²)			
			1995	35	2000	90	2002	35	2015	[5
			Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
3	Manyame River Upstream Sub-Basin	ri,								
		•	,		,	,	ı		-	١.
	Harare R. D.	•	•	•	-	-	1	,	-	
	Manyame R. D.		•	•	-		-	,	-	,
	Total		,		,	•	1		-	
3	Ruwa River Sub-Basin									
	Harare City	High Density	5.29	0.00	5.29	0.00	5.29	0.00	7.65	0.00
		Low Density	2.67	0.28	3.89	0.00	9.44	0.00	9.44	0.00
	Ruwa Local Board	Medium Density	0.18	0.00	0.18	0.00	0.18	0.00	2.66	0.00
		High Density	1.76	0.00	4.89	0.00	6.50	0.00	7.50	0.00
	Epworth Local Board	•	•	,	•		-	•		,
	Goromonzi R. D.	•	•		-	-			•	
	Harare R. D.	-	•	1	,		ì	,		,
	Total		•	•	1	•	1		-	
<u></u>	Seke & Harava Dam Sub-Basin									
		Low Density	00:0	0.00	3.30	0.00	3.30	0.00	3.30	0.00
		High Density	00.00	0.00	2.19	0.00	2.19	0.00	2.19	8.0
	Epworth Local Board	1	•		•	•	·		,	  -
	Goromonzi R. D.	-	•	,		•	,	•	í	,
	Harare R. D.	-	-	•	-	,	•		-	
	Manyame R. D.		•		•	ı	1			١.
	Total		,				í	,	,	•
4)	Nyatsime River Sub-Basin									
		Low Density	0.00	0.00	0.00	0.00	0.00	0.00	2.14	0.00
	Chitungwiza Municipality	Medium Density	3.35	0.00	3.35	0.00	3.35	0.00	8.26	0.00
		High Density	17.78	0.00	17.78	00.0	17.78	0:00	23.23	0.0
	Manyame R. D.		•	•	•	-	•	,	,	,
	Marondera R. D.	1	•	•	-	•	-	•	,	
	Total		,	,	•	,	,	,	,	  -

Table 12.2.3.12 (2) Land Use Area by Sub-Basin and Sewerage/Septic Tank Using (cont'd)

			: : : :			4	, )		(Scenario-1)	rio-1)
	Sub-Basin and Authority	Land Use				Land Use Area (km²)	Vrea (km²)			
			1995	55	2000	Q	2005	)5	2015	.5
		J	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
୭	Mukuvisi River Sub-Basin									
, ===		Low Density	32.14	41.13	32.68	41.13	33.59	41.13	35.22	41.13
		Medium Density	7.47	0.00	11.84	0.00	13.12	0.00	13.12	0.00
	Harare City	High Density	22.60	0.00	25.51	0.00	29.88	0.00	32.60	0.00
	-Casara Ca	Low/Medium Mixed Density	2.00	0.0	2.00	0.00	2.00	00.0	2.00	0.0
	-	Medium/High Mixed Density	6.01	0.00	6.01	0.00	6.01	0.00	6.01	0.00
		High Density High Income	2.36	0.00	2.36	0.00	2.36	0.00	2.36	0.00
	Epworth Local Board		-	•	-	•	•	•	•	
	Harare R. D.	1	1	,	-	•	ı	1	•	1
	Zvimba R. D.	1	ı		_	•	_	•	-	,
	Total		,	,	-	•	-	_	•	,
9	Manyame River Downstream	asin								
	Wanter City	Medium Deneiry	800	80	4 58	000	4.58	00.00	4.58	00.0
	-	High Density	0.0	00:00	1.28	0.0	5.66	0.00	22.79	0.00
	Chitungwiza Municipality	High Density	1.69	0.00	3.44	0.00	3.44	0.00	3.44	0.00
			,	,	-		-	1	*	•
***	Manyame R. D.		•	3	٠	•	•	ı	1	
	Total		ı	•	-		_	1	,	1
<u> </u>	(7) Marimba River Sub-Basin									
, 		Low Density	39.73	0.00	39.73	0.00	39.73	0.00	39.73	0.00
		Medium Density	4.74	0.00	7.84	0.00	19.32	0.00	19.32	0.00
:	Harare City	High Density	17.50	8.0	21.15	0.00	35.65	0.00	41.13	0.00
===	•	Low/Medium Mixed Density	00.00	0.00	00.00	0.00	5.83	0.00	11.67	0.00
==>	•	Medium/High Mixed Density	0.00	0.00	00:00	0.00	0.00	0.00	1.46	0.0
		High Density High Income		00.00	0.36	0.00	0.36	0.00	0.36	0.00
	Zvimba R. D.	•			-	•	-		'	
272	Total		,	,	,	,	•		•	•

Table 12.2.3.12 (3) Land Use Area by Sub-Basin and Sewerage/Septic Tank Using (cont'd)

Land Use   Land Use   Average   Septic   Sewerage										(Scenario-I)	rio-1)
High Density		Sub-Basin and Authority	Land Use				Land Use	Area (km²)			
High Density   Sewerage   Septic   Septic   Sewerage   Septic   Sewerage   Septic   Sewerage   Septic   Septic   Sewerage				199	95	20	00	20	05	50.	5
High Density   0.00   0.00   2.55   0.00   8.10   0.00   9.74     Total	ļ			Sewerage	Septic	Sewerage	Septic	Sewerage		Sewerage	Septic
High Density   0.00   0.00   2.55   0.00   8.10   0.00   9.74	⊗	· · · ·									
Total			High Density	00.0	00.00	2.55	00'0	8.10	00.0	9.74	0.0
Total  Total  Total  Total  Low Density  Low		Chegutu R. D.	•	,	1	,	•	,	1		,
Total  Total  Low Density  Low		Manyame R. D.	1	•		,		,	•	,	
Total   High Density   0.00   0.00   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   7.50   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00		Zvimba R. D.	1	•	٠		•		,		
High Density		Total	1	•				ı	١.		١.
High Density   0.00   0.00   0.00   7.50   0.00   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50   7.50	<u>(</u> ව										
Total  Low Density  Low Densit			High Density	00:0	00.0	00:0	0.00	7.50	00.0	7.50	00.0
Total		Zvimba R. D.	1	,		,	,			<u> </u>	١.
Low Density   10.48   21.41   10.48   22.50   10.48   24.32   17.77		Total		•		1	1	'	,	,	
Low Density   10.48   21.41   10.48   22.50   10.48   24.32   17.77   1.77   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70   1.70	ဗြ										
Total  Low Density  Low Density  Medium Density  Migh Density  Total  To		Harare City	Low Density	10.48	21.41	10.48	22.50	10.48	24.32	17.77	28.15
Total		Mazowe R. D.	-	•	B	-		,	,	,	
Total   Cow Density   0.70   1.13   2.92   0.00   5.39   0.00   17.95     Medium Density   0.70   0.00   0.20   0.00   2.12   0.00   5.50     High Density   3.25   0.00   5.15   0.00   8.00     Total		Zvimba R. D.	\$	-	1	-	1				ļ,
Low Density         0.70         1.13         2.92         0.00         5.39         0.00         17.95           Medium Density         0.20         0.00         0.00         2.12         0.00         5.50           High Density         3.25         0.00         5.15         0.00         5.15         0.00         8.00           Total         -         -         -         -         -         -         -           Total         -         -         -         -         -         -         -		Total		-	1	-	,		ļ ,		١.
Low Density     6.70     1.13     2.92     0.00     5.39     0.00     17.95       Medium Density     0.20     0.00     0.20     0.00     2.12     0.00     5.50       High Density     3.25     0.00     5.15     0.00     5.15     0.00     8.00       Total     -     -     -     -     -     -       Grand Total     -     -     -     -     -	딩	Lake Manyame Sub-Basin									
Council         Medium Density         0.20         0.00         0.212         0.00         5.50           High Density         3.25         0.00         5.15         0.00         8.00           Total         -         -         -         -         -           Grand Total         -         -         -         -         -			Low Density	0.70	1.13	2.92	0.00	5.39	0.00	17.95	0.0
High Density 3.25 0.00 5.15 0.00 8.00   8.00   8.00   S.00   S.		Norton Town Council	Medium Density	0.20	0.00	0.20	0.00	2.12	0.00	5.50	0.00
Total			High Density	3.25	0.00	5.15	00.00	5.15	00.0	8.00	80.0
Total		Chegutu R. D.	•	-	1	-	t	,		,	١,
		Zvimba R. D.	•		,	,	•				,
		Total		•	•		,	-		-	,
1											
		Grand Total		,		-		•	,	1	

Table 12.2.3.13 (1) Population by Sub-Basin and Sewerage/Septic Tank Using

1

Sub-Basin and Authority  (1) Manyame River Upstream Sub-Basin Goromouzi R. D.  Harare R. D.  Manyame R. D.  Total  (2) Ruwa River Sub-Basin  Harare City  Ruwa Local Board  Goromonzi R. D.  Harare R. D.  Harare R. D.  Harare City  Epworth Local Board  Goromouzi R. D.  Harare City  Epworth Local Board  Goromouzi R. D.  Harare City  Epworth Local Board  Goromouzi R. D.  Harare R. D.  Manyame R. D.		Yes	Labre 12.2.3.(1) - ropusati	- Can Ca w	·	- 12 Part 12 14 14 14 14 14 14 14 14 14 14 14 14 14	ropusation by declarate and contrage of the came care	0		(Scenario-1)	rio-1)
Manyame River Upstream Sub-B Goromonzi R. D. Harare R. D. Manyame R. D. Ruwa River Sub-Basin Harare City  Epworth Local Board Goromonzi R. D. Harare R. D. Harare R. D. Harare City  Seke & Harava Dam Sub-Basin Harare City  Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Manyame R. D. Manyame R. D. Ohitungwiza Municipality  Manyame R. D.	1	Sub-Basin and Authority	Land Use				Population	ation			
Manyame River Upstream Sub-B Goromonzi R. D. Harare R. D. Manyame R. D. Ruwa River Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D.				1995	35	2000		2005	35	2015	5
Manyame River Upstream Sub-B Goromonzi R. D. Harare R. D. Ruwa River Sub-Basin Harare City Coromonzi R. D. Harare R. D. Harare R. D. Harare R. D. Harare City Epworth Local Board Goromonzi R. D. Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D.				Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
Goromonzi R. D.  Harare R. D.  Ruwa River Sub-Basin  Harare City  Coromonzi R. D.  Harare R. D.  Harare R. D.  Harare City  Epworth Local Board  Goromonzi R. D.  Harare City  Epworth Local Board  Goromonzi R. D.  Harare City  Epworth Local Board  Goromonzi R. D.  Manyame R. D.  Nyatsime River Sub-Basin  Chitungwiza Municipality  Manyame R. D.		Manyame River Upstream Sub-Basin									
Harare R. D.  Manyame R. D.  Ruwa River Sub-Basin Harare City  Epworth Local Board Goromonzi R. D.  Harare R. D.  Seke & Harava Dam Sub-Basin Harare City  Epworth Local Board Goromonzi R. D.  Harare R. D.  Manyame R. D.		Goromonzi R. D.		0	25.825	0	28,667	0	31,666	0	38,130
Manyame R. D.  Ruwa River Sub-Basin Harare City  Ruwa Local Board Goromonzi R. D. Harare R. D.  Seke & Harava Dam Sub-Basin Harare City  Epworth Local Board Goromonzi R. D.  Harare R. D.  Manyame R. D.	1	Harare R. D.	\$	0	118	0	131	0	145	0	174
Ruwa River Sub-Basin Harare City Ruwa Local Board Goromonzi R. D. Harare R. D. Harare City Epworth Local Board Goromonzi R. D. Harare City Manyame R. D.	يتكلا	Manyame R. D.	•	0	2,339	0	2,596	0	2,868	0	3,454
Ruwa River Sub-Basin Harare City Ruwa Local Board Goromonzi R. D. Harare R. D. Harare R. D. Epworth Local Board Goromonzi R. D. Harare City Epworth Local Board Goromonzi R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.	·L			0	28.282	0	31.394	0	34,679	٥	41,758
Harare City  Ruwa Local Board  Epworth Local Board Goromonzi R. D.  Harare R. D.  Epworth Local Board Goromonzi R. D.  Harare City  Epworth Local Board Goromonzi R. D.  Manyame R. D.  Nyatsime River Sub-Basin  Chitungwiza Municipality  Manyame R. D.  Manyame R. D.											
Ruwa Local Board  Epworth Local Board Goromonzi R. D.  Harare R. D.  Seke & Harava Dam Sub-Basin Harare City  Epworth Local Board Goromonzi R. D.  Harare R. D.  Manyame R. D.  Nyatsime River Sub-Basin  Chitungwiza Municipality  Manyame R. D.  Manyame R. D.		Harare City	High Density	105,800	0	105,800	0	105,800	0	153,000	0
Epworth Local Board Goromonzi R. D. Harare R. D. Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.	4		Low Density	3,204	336	4,668	0	11,328	0	11.328	0
Epworth Local Board Goromonzi R. D. Harare R. D. Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.		Ruwa Local Board	Medium Density	810	0	810	0	810	0	11.970	0
Epworth Local Board Goromonzi R. D. Harare R. D. Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.			High Density	15.840	0	44,010	0	58,500	0	67.500	0
Goromonzi R. D. Harare R. D. Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Manyame R. D.	1	Epworth Local Board	9	0	45,660	50,685	0	55,988	0	67,417	0
Harare R. D.  Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D.  Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.  Manyame R. D.		Goromonzi R. D.	9	0	6.127	0	6,801	0	7,513	0	9,047
Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Manyame R. D.		Harare R. D.	<b>P</b>	0	4,069	0	4,517	0	4,989	0	9009
Seke & Harava Dam Sub-Basin Harare City Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.				125,654	56,192	205,973	11,318	232,426	12,502	311,215	15.055
Harare City  Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Manyame R. D.	т	Seke & Harava Dam Sub-Basin									
Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Marondera R. D.		Harare City	Low Density	0	0	3,960	0	3,960	0	3.960	0
Epworth Local Board Goromonzi R. D. Harare R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Manyame R. D.			High Density	0	0	43.800	0	43.800	0	43,800	٥
Goromonzi R. D. Harne R. D. Manyame R. D. Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Marondera R. D.		Epworth Local Board	ţ	0	4,936	5,479	0	6,053	0	7,288	٥
Harare R. D.  Manyame R. D.  Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D.  Marondera R. D.	-1	Goromonzi R. D.	•	0	117	0	130	0	143	0	173
Manyame R. D.  Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Marondera R. D.	4	Harare R. D.		0	7,463	0	2,489	0	2,749	0	3.310
Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Marondera R. D.		Manyame R. D.	ı	0	973	0	1,080	0	1,193	0	1,436
Nyatsime River Sub-Basin Chitungwiza Municipality Manyame R. D. Marondera R. D.				0	13,489	53,239	3,699	53,813	4,085	55.048	4.919
Chitungwiza Municipality Manyame R. D. Marondera R. D.		Nyatsime River Sub-Basin									
			Low Density	0	0	0	0	0	0	2.568	0
		Chitungwiza Municipality	Medium Density	15.075	0	15.075	0	15.075	0	37,170	
			High Density	355.600	0	355,600	0	355,600	0	464,600	0
		Manyame R. D.	4	0	10,179	0	11,300	0	12,482	0	15,030
		Marondera R. D.	*	0	7,467	0	8,289	0	9,156	0	11.026
		Total		370,675	17.646	370.675	19,589	370.675	21.638	504,338	26,056

Table 12.2.3.13 (2) Population by Sub-Basin and Sewerage/Septic Tank Using (cont'd)

						¥		Ď		(Scenario-1	rio-1)
	Su	Sub-Basin and Authority	Land Use				Popu	Population			
				1995	35	2000	00	2002	)5	2015	15
				Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
<b>ω</b>	Muku	(5) Mukuvisi River Sub-Basin									
, 			Low Density	38.568	49,356	39,216	49,356	40,308	49,356	42,264	49.356
		<del>Lani</del>	Medium Density	33.615	0	53,280	0	59.040	0	59,040	0
	Harare City		High Density	452,000	0	510,200	0	597.600	0	652,000	0
	<del></del>		Low/Medium Mixed Density	4,286	0	4.286	0	4,286	0	4,286	0
				52,451	0	52,451	0	52,451	0	52,451	0
			High Density High Income	10,620	0	10,620	0	10,620	0	10,620	0
<del></del> .	Epwoi	Epworth Local Board		0	17,894	19.864	0	21,942	0	26,421	0
	Haran	Harare R. D.	•	0	1.843	0	2,046	0	2,260	0	2,721
	Zvimt	Zvimba R. D.	-	0	421	0	467	0	516	0	622
		Total		591,540	69,514	689.917	51.869	786,247	52,132	847,082	52,699
9	r	Manyame River Downstream Sub-Basin	и								
	Muki	GIVET TO SCKE LIZITL)		,	(	0.500		01700	ļ	0000	(
	Harar	Harare City	Medium Density	0	٥	0.00,02	>	20.010		70,010	٥
<u>.</u>			High Density	0	0	25,600	0	113,200	0	455,800	0
-		Chitungwiza Municipality	High Density	33,800	0	68,800	0	68,800	0	68.800	0
<del></del> .	Harar	i	•	0	10,128	0	3,081	0	3,404	0	4,099
	Many	Manyame R. D.	•	0	1,466	0	1,627	0	1.797	0	2,164
		Total		33,800	11,594	115,010	4,708	202,610	5.201	545.210	6,263
$\varepsilon$		Marimba River Sub-Basin									
, ha:: p.:			Low Density	47,676	0	47,676	0	47,676	0	47,676	0
			Medium Density	21,330	0	35,280	0	86,940	0	86,940	0
E.	Harar	Harare City	High Density	350,000	0	423,000	0	713,000	0	822,600	0
	columns o		Low/Medium Mixed Density	0	0	0	0	12,493	0	25,007	0
<del></del> =		Emero d		0	0	0	0	0	0	12.742	0
				1,620	0	1,620	0	1,620	0	1,620	0
===	Zviml	Zvimba R. D.		0	2.624	0	2,913	0	3,218	0	3.875
		Total		420,626	2,624	507,576	2,913	861,729	3,218	585966	3.875
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Table 12.2.3.13 (3) Population by Sub-Basin and Sewerage/Septic Tank Using (cont'd)

(Scenario-1)

		***************************************				Domination	ption			
	Sub-Basin and Authority	Land Ose				I			100	ļ
			1995	5	2000	0	2002	2	CTO?	
			Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
10	It ake Chivero Sub-Basin									
9		High Density	0	0	51,000	0	162,000	0	194,800	0
	Chemni & D		0	1,384	0	1,537	0	1,697	0	2,044
	Manyame R. D.	-	0	2,017	0	2,239	0	2,474	0	2.979
	Zvimba R. D.		0	4,649	0	5,160	0	5,700	0	6.864
	Total		0	8,050	51,000	8,936	162,000	9.871	194,800	11,887
9	Muzururu River Sub-Basin									
ì	Harare City	High Density	0	0	0	0	150,000	0	150,000	0
	Zvimba R. D.	ı	0	13,699	0	15.207	0	16.797	0	20,226
·	Total		0	13,699	0	15,207	150,000	16,797	150,000	20,226
15	(10) Gwebi River Sub-Basin									
,	Harare City	Low Density	12,576	25,692	12,576	27,000	12,576	29,184	21,324	33.780
	Mazowe R. D.		0	12,423	0	13,791	0	15,233	0	18,343
	Zvimba R. D.	3	0	19,887	0	22,075	0	24,385	0	29.363
	Total		12,576	58,002	12,576	62,866	12,576	68,802	21,324	81,486
1	(11) Lake Manyame Sub-Basin									
		Low Density	048	1,356	3,504	0	6,468	0	21,540	0
	Norton Town Council	Medium Density	006	0	006	0	9.540	0	24,750	٥
			29.250	0	46,350	0	46,350	0	72,000	0
	Checum R. D.		0	6,026	0	6,689	0	7.389	0	8,897
	Zvimba R. D.	•	0	12,250	0	13,598	0	15,021	0	18,087
	Total		30,990	19,632	50,754	20,287	62,358	22,410	118,290	26.984
_			1,585,861	298,724	2,056,720	232,786	2,894,433	251,335	3,743,892	291,208
	Grand Total									
			1.88	1,884,585	2,289,506	206	3.145.768	.768	4,03	4,035,100

Table 12.2.3.14 (1) Population Projection by Sub-Basin and Sewerage/Septic Tank Using

	Sub-Basin Name					Popul	ition				
		Year	1993	Year 1995	5661	Year 2000	3000	Year	Year 2005	Year 2015	2015
		Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
3	Manyame River Sub-Basin										
	Goromonzi R. D. C.	0	24,720	0	25.825	0	28,667	0	31.666	0	38,130
	Harare R. D. C.	0	113	0	118	0	131	0	145	0	174
	Manyame R. D. C.	0	2,239	0	2,339	0	2,596	0	2.868	0	3,454
	Total	0	27,072	0	28.282	0	31,394	0	34,679	0	41.758
8	Ruwa River Sub-Basin										
	Harare City	78.843	0	84,165	0	97.950	0	112,726	٥	145.926	0
	Ruwa Local Board	1,501	14	1.568	15	1.757	0	1,941	0	2.337	0
-	Epworth Local Board	0	43,707	0	45,660	589'05	0	55.988	0	67,417	0
	Goromonzi R. D. C.	0	5,865	0	6.127	0	6.801	0	7,513	0	9,047
	Harare R. D. C.	0	3,895	0	4,069	0	4,517	0	4.989	0	900'9
	Total	80,344	53,481	85,733	55,871	150,392	11,318	170,655	12.502	215,680	15,055
ල	Seke & Harava Dam Sub-Basin										
	Epworth Local Board	0	4,725	0	4,936	5,479	0	6,053	0	7,288	0
	Goromonzi R. D. C.	0	112	0	117	0	130	0	143	0	173
	Harare R. D. C.	0	7,144	0	7,463	6.077	2,489	6.994	2,749	9,054	3,310
	Manyame R. D. C.	0	931	0	973	0	1,080	0	1,193	0	1,436
	Total	0	12,912	0	13,489	11.557	3,698	13,047	4,085	16,342	4.919
3	Nyatsime River Sub-Basin										
*	Chitungwiza Municipality	296,121	0	330,840	0	423,856	0	526,688	0	758.507	0
	Manyame R. D. C.	0	9,744	0	10,179	0	11,300	0	12,482	0	15.030
	Marondera R. D. C.	0	7,148	0	7.467	0	8.289	0	9.156	0	11.026
	Total	296.121	16.892	330,840	17,647	423,856	19,589	526,688	21,638	758,507	26,055
ହ	Mukuvisi River Sub-Basin										
	Harare City	562,801	25,422	600,791	27,138	161,669	31,583	804,669	36,347	1,041,656	47,052
,	Epworth Local Board	0	17,129	0	17,894	19,864	0	21,942	0	26,421	0
	Harare R. D. C.	0	1,764	0	1,843	0	2,046	0	1 2,260	0	2,721
	Zvimba R. D. C.	0	403	0	421	0	467	0	516	0	622
	Total	562.801	44,718	600,791	47,296	719,054	34,096	826,611	39,123	1.068.077	50,395
9	Manyame River Sub-Basin										
	(Mukuvisi River to Seke Dam)			ı							
	Chitungwiza Municipality	79.622	0	88,957	0	113,968	0	141,618	0	203.950	0
	Harare R. D. C.	0	9.695	0	10,128	8.556	3,081	9.847	3,404	12,747	4,099
	Manyame R. D. C.	0	1,403		1,466	0	1.627	0	1.797	0	2,164
	Total	79,622	11,098	88,957	11,594	122,524	4,708	151,464	5.201	216.697	6.263

Table 12.2.3.14 (2) Population Projection by Sub-Basin and Sewerage/Septic Tank Using (cont'd)

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(Scenario-2)

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						Pomilation	tion				
	Suo-basin Name	Vear 1993	1993	Year 1995	566	Year 2000	000	Year 2005	005	Year 2015	015
		Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic	Sewerage	Septic
	Morimha Divor Suh Basin										
) ==		474.211	0	506.221	0	589,132	0	678.007	0	877,690	0
	Zimba D D	c	2.512	0	2,624	0	2.913	0	3,218	0	3,875
:	Total	474,211	2,512	506,221	2,624	589,132	2,913	678,007	3,218	877.690	3.875
8	Take Chivero Su										
	-2	0	0	0	0	0	0	0	0	0	0
	Chemiti R. D. C.	0	1.325	0	1,384	0	1,537	0	1.697	0	2,044
	Manyame R D C	c	1.931	0	2,017	0	2,239	0	2,474	0	2.979
	Zvimba & D. C.	0	4,450	0	4,649	0	5.160	0	5,700	0	6.864
	Total	0	7.706	0	8,050	0	8,936	0	9.871	0	11.886
9	Muzururu River										,
		0	13,113	0	13,699	0	15.207	0	16,797	0	20,226
	Total	0	13,113	0	13,699	0	15.207	0	16,797	0	20.226
٤	(10) Gwebi River Sub-Basin									•	
<u> </u>	Harare City	9.140	63,702	9.757	68,002	11,355	79,140	13,068	91,078	16,917	117,902
===	Mazowe B D C	С	11.892	0	12,423	0	13,791	0	15,233	0	18,343
	Zimba D O	c	19.036	0	19.887	0	22,075	0	24,385	0	29,363
<del></del>	Total	9,140	94,630	9.757	100,312	11.355	115,005	13,068	130,696	16.917	165,608
ĮΞ	(11) Lake Manyame Sub-Basin										,
	Norton Town Council	20,122	1,238	21,021	1,293	24,770	0	27.362	0	32,947	0
172	Chemin R. D. C.	0	5,768	0	6,026	0	6.689	0	7.389	0	8.897
	Zvimba R. D. C.	0	11,726	0	12,250	0	13,598	0	15.021	0	18.087
		20,122	18,732	21,021	19,569	24,770	20,287	27.362	22,409	32,947	26,984
<u>                                     </u>											
1_		1.522,361	302,866	1.643.322	318,434	2,052,640	267,152	2,406,900	300,221	3,202,857	373.024
	Grand Total										
		1.82	1.825.227	1,96	1,961,755	2,319	2,319,792	2,707,122	7,122	3,575,881	.881

Note: Norton septic tank area 21,360 x 1.13/19.5 = 1,238 Ruwa septic tank area 1,515 x 0.28/31.40 = 14

All of population in Norton, Ruwa and Epcorth will change to sewerage in 2000

Population growth rate; Refer to Case 3 in Sectiobn 6.2

Table 12.2.3.15 (1) Design Sewage Quality in Scenario-1

(Year 2000)

				alayad da albana ayan da asan da asan Anna da asan d	(Year 2000)
Sewage Works	Design Sewage	Pollution Load	Pollution Load	Pollution Load	Design Sewage
_	Quantity	of Domestic	of Industry	of Commerce	Quality
	(m³/day)	(kg/day)	(kg/day)	(kg/day)	(mg/l)
		ВС	OD		
Crowborough	85,468	22,961	12,826	5,442	482
Firle	180,179	32,451	42,715	22,193	540
Marlborough	1,643	227	0	0	138
Donnybrook	7,665	4,655	0	0	607
Harare South	13,203	4,220	1,725	0	450
Jarare East	5,509	3,345	0	0	607
		Lange to the second sec	<u> </u>		
Zengeza	37,495	19,382	1,412	969	580
2011,502.0			<u> </u>		
Norton	6,414	2,257	1,406	113	589
TOTO TOTO		<u></u>			
Ruwa	8,388	2,208	1,907	111	504
I/OTTA	0,000		<u> </u>		
		T	-N		
Crowborough	85,468	5,776	389	1,369	88
Firle	180,179	8,151	1,301	5,574	83
Marlborough	1,643	59	0	0	36
Donnybrook	7,665	1,164	0	0	152
Harare South	13,203	1,062	52	0	84
Harare East	5,509	836	0	0	152
Ualaic Essi	3,303		<u> </u>	I	
7	37,495	4,849	51	242	137
Zengeza	37,433	1,01/	1	<u> </u>	
Notion	6,414	566	83	28	106
NOROH	0,414	1 300	1		
Ruwa	8,388	555	336	28	110
Kuwa	1 0,500	1	1	L	
		7	r-P		
Combonat	T 05 460	629	121	149	11
Crowborough	85,468 180,179	888	404	607	11
Firle	1,643	6	0	0	4
Mariborough	7,665	127	0	0	17
Donnybrook Harare South	13,203	116	16	0	10
		91	0	1 0	17
Harare East	5,509	7,	1	<u> </u>	
7000370	37,495	529	21	26	15
Zengeza	1 37,493	1	L		
Norton	6,414	62	13	3	12
Norton	1 0,414	L	<u> </u>	<u> </u>	. <u>1</u>
Danie	8,388	60	42	3.00	13
Ruwa	0,300	1 00	1 74	1 3.00	







Table 12.2.3.15 (2) Design Sewage Quality in Scenario-1

Sewage Works	Design Sewage  Quantity	Pollution Load of Domestic	Pollution Load	Pollution Load	Design Sewage
	Quantity	of Domestic			
	(-3/1)	Of Domestic	of Industry	of Commerce	Quality
	(m³/day)	(kg/day)	(kg/day)	(kg/day)	(mg/l)
and a second second Second second	and the state of t	B(	)D		
Crowborough	148,074	45,361	12,826	11,006	467
Firle	248,103	41,506	42,715	44,169	517
Marlborough	1,643	227	0	0	138
Donnybrook	7,909	4,655	0	0	589
Harare South	63,611	8,075	44,516	0	827
Harare East	6,278	3,695	0	0	589
- Carrier - Carr					
Zengeza	38,744	19,382	1,641	969	568
	أر مستقد المراف ، حرب أن المراف المراف المراف المراف المراف المراف المراف المراف المراف المرافق المراف				
Norton	12,412	2,811	5,891	141	712
<u> </u>				<u></u>	<del></del>
Ruwa	13,183	3,178	2,543	159	446
		T	-N		
Crowborough	148,074	11,392	389	2,764	98
Firle	248,103	10,417	1,301	11,085	92
Marlborough	1,643	59	0	0	36
Donnybrook	7,909	1,164	0	0	147
Harare South	63,611	2,026	1,355	0	53
Harare East	6,278	924	0	0	147
				<u> </u>	
Zengeza	38,744	4,849	59	243	133
					T
Norton	12,412	708	188	35	75
				<del></del>	T - 00
Ruwa	13,183	800	450	40	98
		1	<b>.</b> P		
Crowborough	148,074	1,241	121	301	11
Firle	248,103	1,135	404	1,208	11
Marlborough	1,643	6	0	0	4
Donnybrook	7,909	127	0	0	16
Harare South	63,611	221	421	0	10
Harare Bast	6,278	101	0	0	16
				·	
Zengeza	38,744	529	25	26	15
				T	<u> </u>
Norton	12,412	77	31	44	9
				1 426	11
Ruwa	13,183	87	56	4.35	1 11

Table 12.2.3.15 (3) Design Sewage Quality in Scenario-1

			american beginning a mengana mendentikan berakan Sebesah Sebesah Sebesah dan dan dian dian dian dian dian dian		(Year 2015)
Sewage Works	Design Sewage	Pollution Load	Pollution Load	Pollution Load	Design Sewage
	Quantity	of Domestic	of Industry	of Commerce	Quality
	(m³/day)	(kg/day)	(kg/day)	(kg/day)	(mg/l)
		ВС	OD		
Crowborough	178,944	51,383	12,826	15,066	443
Firle	309,713	45,440	47,026	61,417	497
Marlborough	4,812	664	0	0	138
Donnybrook	12,317	6,732	0	0	547
Harare South	92,093	23,149	44,516	0	735
Harare East	37,629	4,450	28,877	0	886
Zengeza	70,167	25,345	14,956	1,267	592
					-
Norton	41,304	5,408	35,349	270	993
			700 Marie 101 mar	·	<del></del>
Ruwa	18,376	4,099	3,322	205	415
			gyayan agayar a mahaya dha magayay agayay agaaya dan isabadii adala dha dha dha dha dha dha dha dha dha dh		
		T	·N		
Crowborough	178,944	12,900	389	3,782	95
Firle	309,713	11,401	1,432	15,410	91
Marlborough	4,812	173	0	0	36
Donnybrook	12,317	1,683	0	00	137
Harare South	92,093	5,794	1,355	00	78
Harare East	37,629	1,112	880	0	53
Zengeza	70,167	6,347	535	317	103
	w.,			<del> </del>	
Norton	41,304	1,369	872	68	56
			r		
Ruwa	18,376	1,033	588	52	91
			ter The Spart galaxy, and the spart of the S		
			-P		
Crowborough	178,944	1,405	121	412	11
Firle	309,713	1,242	445	1,679	11
Marlborough	4,812	19	00	0	4
Donnybrook	12,317	184	0	0	15
Harare South	92,093	632	421	0	11
Harare East	37,629	121	274	0	10
		Y	T		
Zengeza	70,167	692	218	35	13
		T 4.6	T		
Norton	41,304	149	143	7	7
		T	T	1	
Ruwa	18,376	112	74	5.60	10







Table 12.2.3.16 (1) Design Sewage Quality in Scenario-2

(Year 2000)

				(Year Zuuu)
Design Sewage	Pollution Load	Pollution Load	Pollution Load	Design Sewage
Quantity	of Domestic			Quality
(m³/day)	(kg/day)	(kg/day)	(kg/day)	(mg/l)
	BO	)D		
84.839	23,121	12,826	5,234	485
AND THE PERSON NAMED IN COLUMN TWO		42,715	21,369	540
	241	0	0	138
	And the same of th	0	0	607
	And the last of th	1,725	0	672
	the state of the s	0	0	607
	Land to the second second			
45,549	23,664	1,412	1,183	577
<u> </u>				
3,810	1,090	1,406	55	670
1	<u> </u>			agen yang dan melan bergan yang makil da dan dalam
3,247	79	1,907	4	613
L				
<u> </u>	T	·N		
84 830	I 5.806	l 389	1,314	89
	THE RESIDENCE OF THE PARTY OF T			84
			0	36
The second name of the last of		AND DESCRIPTION OF THE PARTY OF	0	152
		Land to the second seco		61
			0	152
3,303		1		<u></u>
T 45 540	5 916	51	296	138
43,342	3,210			
3 810	277	83	14	98
3,010				
3 247	20	336	1	110
3,677		<u></u>	<u>, L.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	
	7			
T 04 020			143	11
	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUM			11
	THE RESERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN		0	3
				17
the same of the sa				10
	The second secon	The state of the latest with the state of th	<del>0</del>	17
3,309	<u> </u>			
A5 5/10	645	21	32	15
1 43,347	<u></u>			
3 810	30	13	2	12
J 2,010		1	· <del>L</del>	
3 247	7	42	0.10	14
	Quantity	Quantity (m³/day)         of Domestic (kg/day)           B0           84,839         23,121           183,720         35,148           1,746         241           7,097         4,310           3,547         658           5,509         3,345           45,549         23,664           3,810         1,090           3,247         79           3,247         79           3,247         79           3,826         1,746         63           7,097         1,077         3,547         165           5,509         836           45,549         5,916           3,810         277           3,247         20           84,839         632           183,720         961           1,746         6           7,097         118           3,547         18           5,509         91           45,549         645           3,810         30	Quantity (m³/day)         of Domestic (kg/day)         of Industry (kg/day)           BOD         BOD           84,839         23,121         12,826           183,720         35,148         42,715           1,746         241         0           7,097         4,310         0           3,547         658         1,725           5,509         3,345         0           45,549         23,664         1,412           3,810         1,090         1,406           3,247         79         1,907           T.N         84,839         5,806         389           183,720         8,826         1,301           1,746         63         0           7,097         1,077         0           3,547         165         52           5,509         836         0           45,549         5,916         51           3,816         277         83           3,247         20         336           T-P         84,839         632         121           183,720         961         404           1,746         6         0 <t< td=""><td>Quantity         of Domestic (m³/day)         of Industry (kg/day)         of Commerce (kg/day)           BOD           84,839         23,121         12,826         5,234           183,720         35,148         42,715         21,369           1,746         241         0         0           7,097         4,310         0         0           3,547         658         1,725         0           5,509         3,345         0         0           45,549         23,664         1,412         1,183           3,810         1,090         1,406         55           3,247         79         1,907         4           T-N           84,839         5,806         389         1,314           183,720         8,826         1,301         5,366           1,746         63         0         0           45,549         5,916         51         296           3,810         277         83         14           3,247         20         336         1          </td></t<>	Quantity         of Domestic (m³/day)         of Industry (kg/day)         of Commerce (kg/day)           BOD           84,839         23,121         12,826         5,234           183,720         35,148         42,715         21,369           1,746         241         0         0           7,097         4,310         0         0           3,547         658         1,725         0           5,509         3,345         0         0           45,549         23,664         1,412         1,183           3,810         1,090         1,406         55           3,247         79         1,907         4           T-N           84,839         5,806         389         1,314           183,720         8,826         1,301         5,366           1,746         63         0         0           45,549         5,916         51         296           3,810         277         83         14           3,247         20         336         1

Table 12.2.3.16 (2) Design Sewage Quality in Scenario-2

					(1641 2003)
Sewage Works	Design Sewage	Pollution Load	Pollution Load	Pollution Load	Design Sewage
	Quantity	of Domestic	of Industry	of Commerce	Quality
	(m³/day)	(kg/day)	(kg/day)	(kg/day)	(mg/l)
		B(	)D		
Crowborough	92,730	26,609	12,826	6,896	500
Firle	205,312	40,450	42,715	27,582	539
Marlborough	2,009	277	0	0	138
Donnybrook	8,426	4,960	0	0	589
Harare South	47,148	741	44,516	0	960
Harare East	6,278	3,695	0	0	589
Zengeza	58,099	29,405	1,641	1,470	560
and the contract of the contra					
Norton	7,627	1,231	5,891	62	942
Ruwa	4,328	87	2,543	4	609
		T.			ر المرافق المساورة المرافق الم المرافق المرافق
Crowborough	92,730	6,623	389	1,716	94
Firle	205,312	10,068	1,301	6,865	89
Marlborough	2,009	72	0	0	36
Donnybrook	8,426	1,240	0	0	147
Harare South	47,148	189	1,355	0	33
Harare East	6,278	924	0	0	147
Zengeza	58,099	7,351	59	368	134
	<del></del>				
Norton	7,627	312	188	16	68
	1 4 4 4 4 4		760		100
Ruwa	4,328	22	450	1	109
		T.	·P		
Cambaassak	02 720			197	11
Crowborough Firle	92,730 205,312	721 1,097	121 404	187 748	11
Firie Marlborough	2,009	7	0	0	3
THE RESERVE THE PROPERTY OF THE PROPERTY OF THE PERSON NAMED IN COLUMN 2 IN CO				<del></del>	
Donnybrook  Harare South	8,426 47,148	135 21	0 421	0	16 9
Harare South	6,278	101	0	0	16
Harate Lasi	1 0,276	101	<u> </u>	L	10
Zengeza	58,099	802	25	40	15
evergord	1	L		L	
Norton	7,627	34	31	2	9
CIOI POIS			L.,	<u> </u>	L
Ruwa	4,328	2	56	0.10	13







## Table 12.2.3.16 (3) Design Sewage Quality in Scenario-2

(Year 2015)

					(Ital AVIO)
Sewage Works	Design Sewage	Pollution Load	Pollution Load	Pollution Load	Design Sewage
J	Quantity	of Domestic	of Industry	of Commerce	Quality
	(m³/day)	(kg/day)	(kg/day)	(kg/day)	(mg/l)
		B(	)D		
Crowborough	124,172	34,446	12,826	10,361	464
Firle	277,887	52,363	47,026	42,317	510
Marlborough	2,600	359	0	0	138
Donnybrook	11,747	6,421	0	0	547
Harare South	47,394	959	44,516	0	960
Harare East	37,629	4,450	28,877	0	886
	And the second s				
Zengeza	107,651	42,348	14,956	2,118	552
Norton	26,477	1,516	35,349	76	1,395
Ruwa	5,662	105	3,322	5	606
		T	-N		
Crowborough	124,172	8,573	389	2,579	93
Firle	277,887	13,033	1,432	10,532	90
Marlborough	2,600	93	0	0	36
Mantorougu Donnybrook	11,747	1,605	0	0	137
Harare South	47,394	242	1,355	0	34
Harare East	37,629	1,112	880	0	53
Halaic Last	31,007				
Zengeza	107,651	10,683	535	534	109
Zengeza	107,031				
Norton	26,477	382	872	19	48
Nonon	20,777			<u></u>	
Ruwa	5,662	27	588	1	109
Nuwa	3,002	<u>.L.,</u>			
		7	`P		
	124,172	934	121	281	11
Crowborough	277,887	1,420	445	1,148	11
Firle	2,600	10	0	0	4
Marlborough	11,747	175	0	0	15
Donnybrook	47,394	26	421	0	9
Harare South	37,629	121	274	0	10
Harare East	1 37,029	1			
700000	107,651	1,165	218	58	13
Zengeza	1 107,001	1		<u> </u>	
No do a	26,477	42	143	2	7
Norton	20,411	1	L		
Davida	5,662	3	74	0.15	14
Ruwa	J,00L				



8

Table 12.2.3.17 (1) Domestic Sewage Pollution Load in Scenario-1

(Y	'ear	20	00)

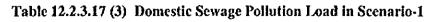
				TO D	(Year 2000)
				BOD	
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load
			(persons)	(g/capita/day)	(kg/day)
		Low Density	52,296	50	
		Medium Density	35,280	47	ļ
		High Density	423,000	44	
	Crowborough	Low/Medium Density	0	49	22,961
		Medium/High Density	0	46	[
		High Density High Income	1,620	47	
		Total	512,196	_	
		ago de la complementa de la complement			p
Harare		Low Density	42,636	50	
		Medium Density	53,280	47	
		High Density	561,200	44	
	Firle	Low/Medium Density	4,286	49	32,451
		Medium/High Density	52,451	46	
		High Density High Income	10,620	47	
		Total	724,473		
	Marlborough	Low Density	4,536	50	227
	Donnybrook	High Density	105,800	44	4,655
	Marie Maryangan and Alba Marie Marie Anna a barra a barra and a state of the state	######################################			
	Harare South	Low Density	3,960	50	
		Medium Density	20,610	47	4,220
Harare		High Density	69,400	44	
Expansion		Total	93,970	<u> </u>	
				<u> </u>	
	Harare East	Epworth (High Density)	76,028	44	3,345
*****	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Zana promonina managaran mana		<del></del>	
	_	Low Density	0	50	
Chitungwiza	Zengeza	Medium Density	15,075	47	19,382
		High Density	424,400	44	
		Total	439,475	<u> </u>	<u></u>
		<del></del>		-	
		Low Density	3,504	50	
Norton	Norton	Medium Density	900	47	2,257
		High Density	46,350	44	
	<u></u>	Total	50,754	<u> </u>	
·····		gan Carried and the Carried State of the Control of the Carried State of			
_	_	Low Density	4,668	50	
Ruwa	Ruwa	Medium Density	810	47	2,208
		High Density	44,010	44	
	<u></u>	Total	49,488	<b>.</b> -	





Table 12.2.3.17 (2) Domestic Sewage Pollution Load in Scenario-1

	A STATE OF THE PARTY OF THE PAR	The state of the s		71 h2	(Teat 2000)	
		]		T-N	[ D-11 42 - I 1	
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load	
			(persons)	(g/capita/day)	(kg/day)	
		Low Density	52,296	13		
		Medium Density	35,280	12		
	1	High Density	423,000	11		
	Crowborough	Low/Medium Density	0	12.5	5,776	
		Medium/High Density	0	11.5		
		High Density High Income	1,620	12	1	
		Total	512,196		<u>L</u>	
•				y-1-2		
Harare	Appelanta de la companya de la compa	Low Density	42,636	13	]	
		Medium Density	53,280	12		
		High Density	561,200	11		
	Firle	Low/Medium Density	4,286	12.5	8,151	
		Medium/High Density	52,451	11.5		
		High Density High Income	10,620	12	j	
		Total	724,473	_		
		The second secon				
	Marlborough	Low Density	4,536	13	59	
		Removed the second seco				
	Donnybrook	High Density	105,800	11	1,164	
		James Marian and Anna				
		Low Density	3,960	13	1,062	
	Harare South	Medium Density	20,610	12		
Нагаге		High Density	69,400	11		
Expansion		Total	93,970	•		
Exponsion						
	Harare East	Epworth (High Density)	76,028	11	836	
		Low Density	0	13		
Chitungwiza	Zengeza	Medium Density	15,075	12	4,849	
Cintuignica	230,800	High Density	424,400	11		
		Total	439,475	•	1	
	1	Low Density	3,504	13		
Norton	Norton	Medium Density	900	12	566	
Nonon	11011011	High Density	46,350	11	]	
		Total	50,754	•	1	
		T 0 2412				
		Low Density	4,668	13		
Ruwa	Ruwa	Medium Density	810	12	555	
NUWA	Muma	High Density	44,010	11	1	
		Total	49,488	-	1	

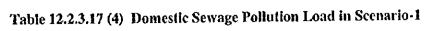


	1			TO IX	(Tear 2000)
		l l	The Lat	T-P	
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load
			(persons)	(g/capita/day)	(kg/day)
		Low Density	52,296	1.40	
		Medium Density	35,280	1.30	
		High Density	423,000	1.20	
	Crowborough	Low/Medium Density	0	1.35	629
		Mediun/High Density	0	1.25	
		High Density High Income	1,620	1.30	
		Total	512,196	•	
				<u> </u>	
Harare		Low Density	42,636	1.40	
	:	Medium Density	53,280	1.30	
		High Density	561,200	1.20	
	Firle	Low/Medium Density	4,286	1.35	888
		Medium/High Density	52,451	1.25	
		High Density High Income	10,620	1.30	
		Total	724,473	•	
	Marlborough	Low Density	4,536	1.40	6
	Donnybrook	High Density	105,800	1.20	127
		Low Density	3,960	1.40	
	Harare South	Medium Density	20,610	1.30	116
Нагаге		High Density	69,400	1.20	
Expansion	·	Total	93,970		
	Harare East	Epworth (High Density)	76,028	1.20	91
		Low Density	0	1.40	
Chitungwiza	Zengeza	Medium Density	15,075	1.30	529
_		High Density	424,400	1.20	
		Total	439,475	-	
		Low Density	3,504	1.40	
Norton	Norton	Medium Density	900	1.30	62
		High Density	46,350	1.20	
	<u></u>	Total	50,754	-	
		Low Density	4,668	1.40	
Ruwa	Ruwa	Medium Density	810	1.30	60
		High Density	44,010	1.20	
		Total	49,488	-	









		and the later program is a later to the contract of the contra		BOD	(1ear 2003)
A.J. G	Campage Waster	Land Use	Pupulation	Unit Load	Pollution Load
Authority	Sewage Works	Taka oze	(persons)	(g/capita/day)	(kg/day)
		Low Density	52,296	50	
		Medium Density	86,940	47	
		High Density	863,000	44	
	Crowborough	Low/Medium Density	12,493	49	45,361
	Clowboloogu	Medium/High Density	0	46	
		High Density High Income	1,620	47	
		Total	1,016,349	-	
Harare	A STATE OF THE PARTY OF THE PAR	Low Density	43,728	50	<u>j</u>
1101010		Medium Density	59,040	47	_
		High Density	759,600	44	
	Firle	Low/Medium Density	4,286	49	41,506
		Medium/High Density	52,451	46	]
		High Density High Income	10,620	47	
		Total	929,725		<u></u>
	Marlborough	Low Density	4,536	50	227
				7	1 4 655
	Donnybrook	High Density	105,800	44	4,655
			4.070		T
		Low Density	3,960	50	8,075
	Harare South	Medium Density	20,610		8,075
Harare	1	High Density	157,000	44	1
Expansion		Total	181,570		1
		The state of the s	02.002	44	3,695
	Harare East	Epworth (High Density)	83,983	1 44	3,023
····		Tan Danis	0	50	T
	"	Low Density	15,075	47	19,382
Chitungwiza	Zengeza	Medium Density	424,400	44	
	-	High Density Total	439,475	<u> </u>	1
	1	IO(a)	132,473		
	<del></del>	Low Density	6,468	50	T
No-t	Norton	Medium Density	9,540	47	2,811
Norton	Notion	High Density	46,350	44	1
		Total	62,358		
	<u></u>	Jotai	1 02,000	<u>. L </u>	
		Low Density	11,328	50	
Ruwa	Ruwa	Medium Density	810	47	3,178
Nuwa	1/uwa	High Density	58,500	44	]
		Total	70,638		]

Table 12.2.3.17 (5) Domestic Sewage Pollution Load in Scenario-1

					(Year 2005)
				T-N	<del></del>
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load
			(persons)	(g/capita/day)	(kg/day)
		Low Density	52,296	13	
		Medium Density	86,940	12	
	1	High Density	863,000	11	
	Crowborough	Low/Medium Density	12,493	12.5	11,392
		Medium/High Density	0	11.5	
		High Density High Income	1,620	12	
		Total	1,016,349	-	
					-
Harare		Low Density	43,728	13	
		Medium Density	59,040	12	
		High Density	759,600	11	
	Firle	Low/Medium Density	4,286	12.5	10,417
		Medium/High Density	52,451	11.5	
		High Density High Income	10,620	12	
		Total	929,725		
	Marlborough	Low Density	4,536	13	59
	Donnybrook	High Density	105,800	11	1,164
	_	ويستان المستريات			-
		Low Density	3,960	13	2,026
	Harare South	Medium Density	20,610	12	
Harare		High Density	157,000	11	
Expansion		Total	181,570		
	Harare East	Epworth (High Density)	83,983	11	924
	<del></del>			·	<u> </u>
		Low Density	0	13	
Chitungwiza	Zengeza	Medium Density	15,075	12	4,849
		High Density	424,400	11	
		Total	439,475	-	
	T				
	l	Low Density	6,468	13	
Norton	Norton	Medium Density	9,540	12	708
		High Density	46,350	11	
	<u> </u>	Total	62,358	<u> </u>	
	T	Turney 1			
_	]	Low Density	11,328	13	
Ruwa	Ruwa	Medium Density	810	12	800
		High Density	58,500	11	
		Total	70,638	-	





Table 12.2.3.17 (6) Domestic Sewage Pollution Load in Scenario-1

		A CONTRACTOR OF THE PROPERTY O	and the second s	T-P	(Year 2005)
منفاء مناهد	Sewage Works	Land Use	Population	Unit Load	Pollution Load
Authority	Sewage Works	Land Osc	(persons)	(g/capita/day)	(kg/day)
		Low Density	52,296	1.40	
	,	Medium Density	86,940	1.30	ĺ
		High Density	863,000	1.20	1
,	Crowborough	Low/Medium Density	12,493	1.35	1,241
		Medium/High Density	0	1.25	]
		High Density High Income	1,620	1.30	]
		Total	1,016,349	-	
Нагаге		Low Density	43,728	1.40	]
		Medium Density	59,040	1.30	]
		High Density	759,600	1.20	]
	Pirle	Low/Medium Density	4,286	1.35	1,135
		Medium/High Density	52,451	1.25	
		High Density High Income	10,620	1.30	
		Total	929,725	<u> </u>	<u> </u>
	Marlborough	Low Density	4,536	1.40	6
	b		105.000	1.20	127
	Donnybrook	High Density	105,800	1.20	12/
	1	Low Density	3,960	1.40	
	Harare South	Medium Density	20,610	1.30	221
TV	Harate South	High Density	157,000	1.20	1
Harare Evension		Total	181,570	•	1
Expansion		10001			
	Harate East	Epworth (High Density)	83,983	1.20	101
	Turate Ess.				
		Low Density	0	1.40	
Chitungwiza	Zengeza	Medium Density	15,075	1.30	529
C/mung.		High Density	424,400	1.20	_
		Total	439,475	•	<u>                                     </u>
-					<del></del>
		Low Density	6,468	1.40	
Norton	Norton	Medium Density	9,540	1.30	77
		High Density	46,350	1.20	1
		Total	62,358	-	<u> </u>
			41.222	1 40	<del>γ</del>
	1	Low Density	11,328	1.40	87
Ruwa	Ruwa	Medium Density	810	1.30	-{ °'
	1	High Density	58,500	1.20	-
	1	Total	70,638	<u></u>	<u></u>

Table 12.2.3.17 (7) Domestic Sewage Pollution Load in Scenario-1

4Y	ea	r	20	1	51

				non	(1eat 2015)	
	, <u></u>	,,		BOD		
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load	
			(persons)	(g/capita/day)	(kg/day)	
		Low Density	52,296	50		
		Medium Density	86,940	47		
		High Density	972,600	44		
Cto	Crowborough	Low/Medium Density	25,007	49	51,383	
		Medium/High Density	12,742	46		
		High Density High Income	1,620	47	[	
		Total	1,151,205	-		
Harare		Low Density	45,684	50		
		Medium Density	59,040	47		
	,	High Density	846,800	44		
	Firle	Low/Medium Density	4,286	49	45,440	
		Medium/High Density	52,451	46		
		High Density High Income	10,620	47		
		Total	1,018,881	_		
				grandens and Thin I would be in This		
ļ	Marlborough	Low Density	13,284	50	664	
				<del></del>		
	Donnybrook	High Density	153,000	44	6,732	
			2000	50	<del></del>	
		Low Density	3,960	50	22.140	
	Harare South	Medium Density	20,610	47	23,149	
Harare		High Density	499,600	44	1	
Expansion		Total	524,170		<u></u>	
	M D	Epworth (High Density)	101,126	44	4,450	
	Harare East	Epworth (right Density)	101,120	44	1 4,430	
		Low Density	2,568	50	<u> </u>	
Chitungwiza	Zengeza	Medium Density	37,170	47	25,345	
Cintungwiza	Zengeza	High Density	533,400	44	25,545	
		Total	573,138			
	L	10141	010,100		I	
		Low Density	21,540	50		
Norton	Norton	Medium Density	24,750	47	5,408	
14011011	10000	High Density	72,000	44	1 -,	
		Total	118,290		Í	
	L	Transfer and the second	L		1	
		Low Density	11,328	50	<u> </u>	
Ruwa	Ruwa	Medium Density	11,970	47	4,099	
Ma	Kuwa	High Density	67,500	44	4,077	
1	i	Total	90,798	<del> </del>	<b>!</b>	

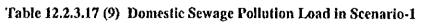


## Table 12.2.3.17 (8) Domestic Sewage Pollution Load in Scenario-1

(Year 2015)

		Market and the second s			(Ital 2013)	
				T-N		
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load	
			(persons)	(g/capita/day)	(kg/day)	
-		Low Density	52,296	13	]	
		Medium Density	86,940	12	]	
		High Density	972,600	11	1	
	Crowborough	Low/Medium Density	25,007	12.5	12,900	
		Medium/High Density	12,742	11.5	]	
		High Density High Income	1,620	12	]	
		Total	1,151,205	<u> </u>	<u> </u>	
Harare		Low Density	45,684	13	Į	
		Medium Density	59,040	12	j	
		High Density	846,800	11		
	Firle	Low/Medium Density	4,286	12.5	11,401	
		Medium/High Density	52,451	11.5	]	
		High Density High Income	10,620	12		
		Total	1,018,881			
	Mariborough	Low Density	13,284	13	173	
	Donnybrook	High Density	153,000	11	1,683	
		Low Density	3,960	13		
	Harare South	Medium Density	20,610	12	5,794	
Harare		High Density	499,600	11		
Expansion		Total	524,170	<u> </u>		
				7	1 1112	
-	Harare East	Epworth (High Density)	101,126	11	1,112	
			7-2-2-	1 42	<del></del>	
		Low Density	2,568	13	6247	
Chitungwiza	Zengeza	Medium Density	37,170	12	6,347	
		High Density	533,400	11	4	
		Total	573,138	<u> </u>	<u></u>	
			24.540	12	T	
		Low Density	21,540	13	1260	
Norton	Norton	Medium Density	24,750	12	1,369	
		High Density	72,000	11	1	
		Total	118,290	L	<u> </u>	
			11.020	12	T	
	1 _	Low Density	11,328	13	1 1 1 1 1 1 1 1	
Ruwa	Ruwa	Medium Density	11,970	12	1,033	
		High Density	67,500	11		
		Total	90,798	*	L	

B



				7. 7.	(Year 2015)	
]		,		T-P	T	
Authority	Sewage Works	Land Use	Pupulation	Unit Load	Pollution Load	
			(persons)	(g/capita/day)	(kg/day)	
		Low Density	52,296	1.40		
		Medium Density	86,940	1.30		
		High Density	972,600	1.20		
	Crowborough	Low/Medium Density	25,007	1.35	1,405	
		Medium/High Density	12,742	1.25		
		High Density High Income	1,620	1.30		
		Total	1,151,205	<u> </u>		
				7 <del></del>		
Harare		Low Density	45,684	1.40		
		Medium Density	59,040	1.30		
		High Density	846,800	1.20		
	Firle	Low/Medium Density	4,286	1.35	1,242	
		Medium/High Density	52,451	1.25		
		High Density High Income	10,620	1.30		
		Total	1,018,881			
	·					
	Marlborough	Low Density	13,284	1.40	19	
	Donnybrook	High Density	153,000	1.20	184	
			-			
		Low Density	3,960	1.40		
	Harare South	Medium Density	20,610	1.30	632	
Harare		High Density	499,600	1.20		
Expansion		Total	524,170			
			10111			
	Harare East	Epworth (High Density)	101,126	1.20	121	
	~~~	Law Dansitu	0.570	1.40		
Chihunandan	7	Low Density	2,568	1.40	602	
Chitungwiza	Zengeza	Medium Density	37,170	1.30	692	
		High Density	533,400	1.20		
***************************************		Total	573,138	-		
		Low Density	21 540	1.40	·	
Norton	Norton		21,540	1.40	140	
Norton Norton		Medium Density High Density	24,750	1.30	149	
		High Density Total	72,000	1.20		
		I Otal	118,290	•		
		Low Density	11 220	1 40		
Ruwa	Ruwa	Medium Density	11,328	1.40	110	
Nuwa	Nuwa		11,970	1.30	112	
		High Density	67,500	1.20	-	
		Total	90,798	•		



Table 12.2.3.18 Domestic Sewage Pollution Load in Scenario-2

Sewage	Population	Unit D	Domestic Pollution Load							
Works	·	BOD	T-N	T-P	BOD	T-N	T-P			
	(persons)	(g/capita/day)	(g/capita/day)	(g/capita/day)	(kg/day)	(kg/day)	(kg/day)			
	Year 2000									
Crowborough	513,799	45	11.3	1.23	23,121	5,806	632			
Firle	781,060	45	11.3	1.23	35,148	8,826	961			
Marlborough	4,819	50	13.0	1.32	241	63	6			
Donnybrook	97,950	44	11.0	1.20	4,310	1,077	118			
Harare South	14,633	45	11.3	1.23	658	165	18			
Harare East	76,028	44	11.0	1.20	3,345	836	91			
Zengeza	537,824	44	11.0	1.20	23,664	5,916	645			
Norton	24,770	44	11.2	1.22	1,090	277	30			
Ruwa	1,757	45	11.2	1.21	79	20	22			
			Y	ear 2005						
Crowborough	591,309	45	11.2	1.22	26,609	6,623	721			
Firle	898,888	45	11.2	1,22	40,450	10,068	1,097			
Marlborough	5,546	50	13.0	1.32	277	72	7			
Donnybrook	112,726	44	11.0	1.20	4,960	1,240	135			
Harare South	16,841	44	11.2	1.22	741	189	21			
Harare Bast	83,982	44	11.0	1.20	3,695	924	101			
Zengeza	668,304	44	11,0	1.20	29,405	7,351	802			
Norton	27,362	45	11.4	1.23	1,231	312	34			
Ruwa	1,940	45	11.3	1.23	87	22	2			
	<u></u>				· y-					
			Y	ear 2015						
Crowborough	765,459	45	11.2	1.22	34,446	8,573	934			
Firle	1,163,625	45	11.2	1.22	52,363	13,033	1,420			
Marlborough	7,179	50	13.0	1.43	359	93	10			
Donnybrook	145,926	44	11.0	1.20	6,421	1,605	175			
Harare South	21,801	44	11.1	1.21	959	242	26			
Harare East	101,126	44	11.0	1.20	4,450	1,112	121			
Zengeza	962,456	44	11.1	1.21	42,348	10,683	1,165			
Norton	32,947	46	11.6	1.26	1,516	382	42			
Ruwa	2,336	45	11.4	1.23	105	27	3			

Table 12.2.3.19 Unit Domestic Sewage Pollution Load in Scenario-2

Sewage	Population in	Pollutio	n Load in Sc	enario-1	Unit D	omestic Pollutio	n Load
Works	Scenario-1	BOD	T-N	T-P	BOD	T-N	T-P
	(persons)	(kg/day)	(kg/day)	(kg/day)	(g/capita/day)	(g/capita/day)	(g/capita/day)
				Year 200	0		
Crowborough	512,196	22,961	5,776	629	45	11.3	1.23
Firle	724,473	32,451	8,151	888	45	11.3	1.23
Marlborough	4,536	227	59	6	50	13.0	1.32
Donnybrook	105,800	4,655	1,164	127	44	11.0	1.20
Harare South	93,970	4,220	1,062	116	45	11.3	1.23
Harare East	76,028	3,345	836	91	44	11.0	1.20
7engeza	439,475	19,382	4,849	529	44	11.0	1.20
Norton	50,754	2,257	566	62	44	11.2	1.22
Ruwa	49,488	2,208	555	60	45	11.2	1.21
	<u></u>						
				Year 200)5		
Crowborough	1,016,349	45,361	11,392	1,241	45	11.2	1.22
Firle	929,725	41,506	10,417	1,135	45	11.2	1.22
Marlborough	4,536	227	59	6	50	13.0	1.32
Donnybrook	105,800	4,655	1,164	127	44	11.0	1.20
Harare South	181,570	8,075	2,026	221	44	11.2	1.22
Harare East	83,983	3,695	924	101	44	11.0	1.20
Zengeza	439,475	19,382	4,849	529	44	11.0	1.20
Norton	62,358	2,811	708	77	45	11.4	1.23
Ruwa	70,638	3,178	800	87	45	11.3	1.23
	<u> </u>						
				Year 201	5		
Crowborough	1,151,205	51,383	12,900	1,405	45	11.2	1.22
Firle	1,018,881	45,440	11,401	1,242	45	11.2	1.22
Marlborough	13,284	664	173	19	50	13.0	1.43
Donnybrook	153,000	6,732	1,683	184	44	11.0	1.20
Harare South	524,170	23,149	5,794	632	44	11.1	1.21
Harare East	101,126	4,450	1,112	121	. 44	11.0	1.20
Zengeza	573,138	25,345	6,347	692	44	11.1	1.21
Norton	118,290	5,408	1,369	149	46	11.6	1.26
Ruwa	90,798	4,099	1,033	112	45	11.4	1.23





Table 12.2.3.20 Industrial Wastewater Pollution Load

Authority	Sub-Basin	Item	Wastewater Pollution Load (kg/day)				
	į,		2000	2005	2015		
		BOD	12,826	12,826	12,826		
	Marimba River	COD	35,721	35,721	35,721		
	Sub-Basin	SS	8,520	8,520	8,520		
	(Crowborough)	T-N	389	389	389		
	(4.0	Т-Р	121	121	121		
Harare							
1		BOD	42,715	42,715	47,026		
	Mukuvisi River	COD	118,956	118,956	130,949		
1	Sub-Basin	SS	28,376	28,376	31,243		
	(Firle)	T-N	1,301	1,301	1,432		
	` ´	T-P	404	404	445		
		BOD	0	0	28,877		
	Ruwa River	COD	0	0	80,420		
j	Sub-Basin	SS	0	0	19,182		
	(Harare East)	T-N	0	0	880		
Harare		T-P	0	0	274		
Expansion	, <u>, , , , , , , , , , , , , , , , , , </u>						
		BOD	1,725	44,516	44,516		
	Manyame River	COD	4,804	123,960	123,960		
	Sub-Basin	SS	1,147	29,573	29,573		
	(Harare South)	T-N	52	1,355	1,355		
	(T-P	16	421	421		
		BOD	1,412	1,641	14,956		
	Nyatsime River	COD	3,364	3,909	35,607		
Chitungwiza	Sub-Basin	SS	708	822	7,489		
Cii.tsi.g.	(Zengeza)	T-N	51	59	535		
	(0)	T-P	21	25	218		
		<u> </u>					
	الاستانية <u>بي مساورة من من من بين بين من من بين بين من ب</u>	BOD	1,406	5,891	35,349		
	Lake Manyame	COD	5,176	23,940	147,158		
Norton	Sub-Basin	SS	820	2,049	10,123		
11011011	(Norton)	T-N	83	188	872		
	(T-P	13	31	143		
		L					
		BOD	1,907	2,543	3,322		
	Ruwa River	COD	6,806	9,077	11,858		
Ruwa	Sub-Basin	SS	6,103	8,136	10,631		
	(Ruwa)	T-N	336	450	588		
		T-P	42	56	74		
		<u> </u>					
		BOD	61,991	110,132	186,872		
		COD	174,827	315,563	565,673		
Total Pa	ollution Load	SS	45,674	77,476	116,761		
10tal I v	DESCRIPTION EVENT	T-N	2,212	3,742	6,051		
		T-P	617	1,058	1,696		

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Table 12.2.3.21 (1) Commercial Wastewater Pollution Load in Scenario-1

(Year 2000)

			T 7 11 .		(101 2000)			
Sewage	Domestic	Commercial	Pollution	Sewage	Commercial			
Works	Quantity	Quantity	Load of	Quality of	Pollution			
			Domestic	Domestic	Load			
	(m³/day)	(m³/day)	(kg/day)	(mg/l)	(kg/day)			
		В	OD					
Crowborough	50,871	12,057	22,961	451	5,442			
Firle	70,518	48,227	32,451	460	22,193			
Zengeza	29,903	1,495	19,382	648	969			
Norton	4,213	211	2,257	536	113			
Ruwa	4,413	221	2,208	500	111			
		T	·N					
Crowborough	50,871	12,057	5,776	114	1,369			
Firle	70,518	48,227	8,151	116	5,574			
Zengeza	29,903	1,495	4,849	162	242			
Norton	4,213	211	566	134	28			
Ruwa	4,413	221	555	126	28			
	T-P							
Crowborough	50,871	12,057	629	12	149			
Firle	70,518	48,227	888	13	607			
Zengeza	29,903	1,495	529	18	26			
Norton	4,213	211	62	15	3			
Ruwa	4,413	221	60	14	3.00			

/					(Ital Evos)
Sewage	Domestic	Commercial	Pollution	Sewage	Commercial
Works	Quantity	Quantity	Load of	Quality of	Pollution
			Domestic	Domestic	Load
	(m³/day)	(m³/day)	(kg/day)	(mg/l)	(kg/day)
		В	OD		
Crowborough	94,451	22,917	45,361	480	11,006
Firle	86,142	91,668	41,506	482	44,169
Zengeza	30,752	1,538	19,382	630	969
Norton	7,054	353	2,811	398	141
Ruwa	7,541	377	3,178	421	159
		T	·N		
Crowborough	94,451	22,917	11,392	121	2,764
Firle	86,142	91,668	10,417	121	11,085
Zengeza	30,752	1,538	4,849	158	243
Norton	7,054	353	708	100	35
Ruwa	7,541	377	800	106	40
		T	-P		
Crowborough	94,451	22,917	1,241	13	301
Firle	86,142	91,668	1,135	13	1,208
Zengeza	30,752	1,538	529	17	26
Norton	7,054	353	77	11	4
Ruwa	7,541	377	87	12	4.35

Table 12.2.3.21 (2) Commercial Wastewater Pollution Load in Scenario-1

Sewage	Domestic	Commercial	Pollution	Sewage	Commercial
Works	Quantity	Quantity	Load of	Quality of	Pollution
	•		Domestic	Domestic	Load
	(ni³/day)	(m³/day)	(kg/day)	(mg/l)	(kg/day)
And the second s		В	OD		
Crowborough	111,514	32,697	51,383	461	15,066
Firle	96,765	130,789	45,440	470	61,417
Zengeza	45,953	2,298	25,345	552	1,267
Norton	17,023	851	5,408	318	270
Ruwa	10,807	540	4,099	379	205
		T	-N		
Crowborough	111,514	32,697	12,900	116	3,782
Firle	96,765	130,789	11,401	118	15,410
Zengeza	45,953	2,298	6,347	138	317
Norton	17,023	851	1,369	80	68
Ruwa	10,807	540	1,033	96	52
		Т	•P	general and the second	
Crowborough	111,514	32,697	1,405	13	412
Firle	96,765	130,789	1,242	13	1,679
Zengeza	45,953	2,298	692	15	35
Norton	17,023	851	149	9	7
Ruwa	10,807	540	112	10	5.60

Table 12.2.3.22 (1) Commercial Wastewater Pollution Load in Scenario-2

(Year 2000)

Sewage	Domestic	Commercial	Pollution	Sewage	Commercial
Works	Quantity	Quantity	Load of	Quality of	Pollution
HUIKS	Quainity	Quantity	Domestic	Domestic	Load
	(m³/day)	(m³/day)			
	(m/day)	the same of the sa	(kg/day)	(mg/l)	(kg/day)
)D		
Crowborough	50,866	11,515	23,121	455	5,234
Firle	75,763	46,061	35,148	464	21,369
Zengeza	36,573	1,829	23,664	647	1,183
Norton	2,056	103	1,090	530	55
Ruwa	156	8	79	506	4
		T	N		
Crowborough	50,866	11,515	5,806	114	1,314
Firle	75,763	46,061	8,826	116	5,366
Zengeza	36,573	1,829	5,916	162	296
Norton	2,056	103	277	135	14
Ruwa	156	8	20	128	1
	The Control of the state of the	T	.P	,	
Crowborough	50,866	11,515	632	12	143
Firle	75,763	46,061	961	13	584
Zengeza	36,573	1,829	645	18	32
Norton	2,056	103	30	15	2
Ruwa	156	8	2	13	0.10

Sewage	Domestic	Commercial	Pollution	Sewage	Commercial
Works	Quantity	Quantity	Load of	Quality of	Pollution
			Domestic	Domestic	Load
	(m³/day)	(m³/day)	(kg/day)	(mg/l)	(kg/day)
		ВС	OD		
Crowborough	54,992	14,251	26,609	484	6,896
Firle	83,597	57,003	40,450	484	27,582
Zengeza	46,781	2,339	29,405	629	1,470
Norton	3,092	155	1,231	398	62
Ruwa	208	10	87	418	4
		T	·N		
Crowborough	54,992	14,251	6,623	120	1,716
Firle	83,597	57,003	10,068	120	6,865
Zengeza	46,781	2,339	7,351	157	368
Norton	3,092	155	312	101	16
Ruwa	208	10	22	106	1
		T	.P		
Crowborough	54,992	14,251	721	13	187
Firle	83,597	57,003	1,097	13	748
Zengeza	46,781	2,339	802	17	40
Norton	3,092	155	34	11	2
Ruwa	208	10	2	10	0.10

Table 12.2.3.22 (2) Commercial Wastewater Pollution Load in Scenario-2 (Year 2015)

					(1ear 2015)
Sewage	Domestic	Commercial	Pollution	Sewage	Commercial
Works	Quantity	Quantity	Load of	Quality of	Pollution
			Domestic	Domestic	Load
	(m³/day)	(m³/day)	(kg/day)	(mg/l)	(kg/day)
BOD					
Crowborough	74,250	22,334	34,446	464	10,361
Firle	110,544	89,335	52,363	474	42,317
Zengeza	76,996	3,850	42,348	550	2,118
Norton	4,744	237	1,516	320	76
Ruwa	278	14	105	378	5
T·N					
Crowborough	74,250	22,334	8,573	115	2,579
Firle	110,544	89,335	13,033	118	10,532
Zengeza	76,996	3,850	10,683	139	534
Norton	4,744	237	382	81	19
Ruwa	278	14	27	97	1
T-P					
Crowborough	74,250	22,334	934	13	281
Firle	110,544	89,335	1,420	13	1,148
Zengeza	76,996	3,850	1,165	15	58
Norton	4,744	237	42	9	2
Ruwa	278	14	3	11	0.15