

Koringberg Distribution System - Input Variables for Water Requirement Model								
Parameter / Variable	Year	Income Categorization				Com. & Ind. <sup>(D)</sup>	Other <sup>(E)</sup>	Total
		HI	MI	LI	Sub- Total			
Units are presented in brackets with the "Parameter Description" - First Column								
Population <sup>(A)</sup>	2019	308	1228	125	1661	-	-	-
	2024	332	1389	300	2021			
	2029	358	1572	530	2459			
	2034	385	1778	829	2992			
	2039	415	2012	1213	3640			
	2044	447	2276	1706	4429			
Growth (%/year)		Growth in Population				Growth in Demand		
	2019-2024	1.50%	2.50%	19.07%	4.00%	4%	2%	
	2024-2029	1.50%	2.50%	12.04%	4.00%	4%	2%	
	2029-2034	1.50%	2.50%	9.35%	4.00%	4%	2%	
	2034-2039	1.50%	2.50%	7.93%	4.00%	4%	2%	
	2039-2044	1.50%	2.50%	7.05%	4.00%	4%	2%	
Unit Demand (l/c/d) <sup>(B)</sup>	2019	70.0	55.0	30.0	-	-	-	-
Average Annual Daily Water Requirement (KI/d - NRW Excluded)	2019	22	68	4	-	15	4	112
	2024	23	76	9		18	4	131
	2029	25	86	16		22	5	154
	2034	27	98	25		27	5	182
	2039	29	111	36		33	6	215
	2044	31	125	51		40	7	254
NRW (%) <sup>(C)</sup>	2019	32.7	32.7	32.7	-	32.7	32.7	-
	2024	25.0	25.0	25.0		25.0	25.0	
	2029	22.5	22.5	22.5		22.5	22.5	
	2034	20.0	20.0	20.0		20.0	20.0	
	2039	17.5	17.5	17.5		17.5	17.5	
	2044	15.0	15.0	15.0		15.0	15.0	
Average Annual Daily Water Requirement (KI/d)	2019	32	100	6	-	22	6	166
	2024	31	102	12		24	6	175
	2029	32	112	21		29	6	199
	2034	34	122	31		34	7	228
	2039	35	134	44		40	7	261
	2044	37	147	60		47	8	299
Average Peak Month Daily Water Requirement (KI/d)	2019	61	192	11	-	43	11	317
	2024	59	195	23		46	11	334
	2029	62	213	39		55	12	381
	2034	64	234	59		64	13	435
	2039	67	256	84		76	14	498
	2044	70	281	115		90	15	571
Peak Day Water Requirement (KI/d)	2019	77	240	13	-	53	14	397
	2024	74	243	29		58	14	418
	2029	77	266	49		68	15	476
	2034	80	292	74		81	16	543
	2039	84	320	105		95	17	622
	2044	88	352	144		112	18	714
Total Annual Water Requirement (KI/year)	2019	11701	36624	2041	-	8135	2169	60670
	2024	11311	37183	4383		8882	2149	63908
	2029	11792	40712	7488		10457	2296	72745
	2034	12306	44622	11342		12325	2456	83052
	2039	12855	48956	16105		14541	2630	95088
	2044	13442	53760	21973		17171	2818	109164
Peak Month Factor <sup>(F)</sup>	1.91							
Peak Day Factor <sup>(G)</sup>	1.25							

Notes : →

TO USE THIS SHEET, FILL IN THE VARIABLES IN THE SHADED BLOCKS ABOVE

References:

- (A) - Projected population for 2019/2020 is based on the Census 2011 data and the estimated future population growth, as agreed with Municipality during January 2014.
- (B) - Residential unit demands estimated.
- (C) - Non Revenue Water (NRW): Calculated NRW from July 2019 to June 2020. Estimated 7.7 % reduction of NRW over the next five years.
- (D) - Commercial and Industrial: Calculated from Billed Metered Consumption data for the period July 2016 to June 2017. Average 15 kl/d.
- (E) - Others: Calculated from Billed Metered Consumption data for the period July 2016 to June 2017. Average 4 kl/d.
- (F) - Peak Month Factor: Maximum value calculated from July 2015 to June 2020 data.
- (G) - Peak Day Factor : Estimated

Year *	Measured Potable Water Requirement (System Input)	Projected Water Requirement from model	Other Projections			WWTW Flow and Projections (KI/a)				
			2% Annual growth on 2016/2017 Water Requirement	4% Annual growth on 2016/2017 Water Requirement	DWS's Reconciliation Strategy (March 2016)			Annual WWTW Flow (Estimated from Billed Metered Consumption Data)	Percentage (WWTW Flow / System Input)	Projected WWTW Flow
					Low	Medium	High			
1995	43 050									
1996	53 931									
1997	47 897									
1998	36 821									
1999	41 634									
2000	38 066									
2001	30 064									
2002	29 589							25 970	87.77%	
2003	39 878							28 931	72.55%	
2004	42 388							25 544	60.26%	
2005	47 543							26 668	56.09%	
2006	58 136							28 866	49.65%	
2007	57 829							29 578	51.15%	
2008	62 809							38 561	61.39%	
2009	85 766							31 896	37.19%	
2010	59 952							32 616	54.40%	
2011	48 167							33 156	68.83%	
2012	62 777							32 247	51.37%	
2013	56 396							34 115	60.49%	
2014	69 202							41 287	59.66%	
2015	64 578				69 000	69 000	69 000	38 892	60.09%	
2016	60 128							35 886	59.68%	
2017	44 157							20 961	47.47%	
2018	46 609							22 341	47.93%	
2019	51 908	60 670	60 128	60 128				24 506	47.21%	
2024		63 908	66 386	73 155	94 800	99 200	103 600		60.00%	38 345
2029		72 745	73 296	89 004	112 400	120 600	128 800		70.00%	50 922
2034		83 052	80 924	108 287	135 200	149 000	163 600		80.00%	66 441
2039		95 088	89 347	131 748	159 200	179 000	200 600		80.00%	76 070
2044		109 164	98 646	160 291					80.00%	87 331

Notes: (\*) The years in the above table refer to the Municipal Financial Years and is for the period July till June the following year. The measured demand for 2019 is therefore from July 2019 up to June 2020

