

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>	2018	296	1181	121	1598			
	2023	319	1336	289	1944			
	2028	344	1511	510	2365			
	2033	370	1710	797	2877			
	2038	399	1935	1167	3500			
	2043	430	2189	1640	4259			
Growth (%/year)		Growth in Population				Growth in Demand		
	2018-2023	1.50%	2.50%	19.07%	4.00%	4%	2%	
	2023-2028	1.50%	2.50%	12.04%	4.00%	4%	2%	
	2028-2033	1.50%	2.50%	9.35%	4.00%	4%	2%	
	2033-2038	1.50%	2.50%	7.93%	4.00%	4%	2%	
2038-2043	1.50%	2.50%	7.05%	4.00%	4%	2%		
Unit Demand (l/c/d) <sup>(B)</sup>	2018	80.0	55.0	30.0	-	-	-	-
Average Annual Daily Water Requirement (Kl/d - NRW Excluded)	2018	24	65	4		15	4	111
	2023	26	73	9		18	4	130
	2028	28	83	15		22	5	153
	2033	30	94	24		27	5	180
	2038	32	106	35		33	6	212
	2043	34	120	49		40	7	251
NRW (%) <sup>(C)</sup>	2018	31.5	31.5	31.5		31.5	31.5	
	2023	25.0	25.0	25.0		25.0	25.0	
	2028	22.5	22.5	22.5		22.5	22.5	
	2033	20.0	20.0	20.0		20.0	20.0	
	2038	17.5	17.5	17.5		17.5	17.5	
	2043	15.0	15.0	15.0		15.0	15.0	
Average Annual Daily Water Requirement (Kl/d)	2018	35	95	5		22	6	162
	2023	34	98	12		24	6	174
	2028	36	107	20		29	6	197
	2033	37	118	30		34	7	225
	2038	39	129	42		40	7	257
	2043	40	142	58		47	8	295
Average Peak Month Daily Water Requirement (Kl/d)	2018	66	181	10		42	11	310
	2023	65	187	22		46	11	332
	2028	68	205	38		55	12	377
	2033	71	225	57		64	13	430
	2038	74	246	81		76	14	491
	2043	77	271	111		90	15	563
Peak Day Water Requirement (Kl/d)	2018	83	226	13		52	14	388
	2023	81	234	28		58	14	415
	2028	85	256	47		68	15	471
	2033	88	281	71		81	16	537
	2038	92	308	101		95	17	614
	2043	97	338	138		112	18	704
Total Annual Water Requirement (Kl/year)	2018	12632	34599	1928		7993	2131	59283
	2023	12429	35753	4215		8882	2149	63428
	2028	12958	39146	7200		10457	2296	72058
	2033	13523	42906	10905		12325	2456	82116
	2038	14127	47073	15486		14541	2630	93857
	2043	14771	51693	21128		17171	2818	107581
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) - Total population based on Census 2011 data. Future estimated growth agreed with Municipality in January 2014.

(B) - Residential unit demands estimated.

(C) - Non Revenue Water (NRW): Calculated NRW from July 2018 to June 2019. Estimated 6.5 % 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 2014 to June 2016 data.

(G) - Peak Day Factor : Estimated

Koringberg Distribution System Projected Water Requirements (Kl/a)								
Year *	Measured Potable Water Requirement (System Input)	Projected Water Requirement from model	2% Annual growth on 2016/2017 Water Requirement	4% Annual growth on 2016/2017 Water Requirement	Other Projections			Annual WWTW Flows (Estimated from Billed Metered Consumption Data)
					DWS's Reconciliation Strategy (March 2016)			
					Low	Medium	High	
2001	30,064							
2002	29,589							25,970
2003	39,878							28,931
2004	42,388							25,544
2005	47,543							26,668
2006	58,136							28,866
2007	57,829							29,578
2008	62,909							38,561
2009	85,766							31,896
2010	59,952							32,616
2011	48,167							33,156
2012	62,777							32,247
2013	56,396							34,115
2014	69,202							41,287
2015	64,578				69,000	69,000	69,000	38,802
2016	60,128							35,886
2017	44,157							20,961
2018	46,609	59,283	60,128	60,128				22,341
2023		63,428	66,386	73,155	91,600	95,400	99,200	
2028		72,058	73,296	89,004	108,800	116,200	123,600	
2033		82,116	80,924	108,287	130,400	143,000	156,200	
2038		93,857	89,347	131,743	154,400	173,000	193,200	
2043		107,581	98,646	160,291				

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 2018 is therefore from July 2018 up to June 2019

**KORINGBERG - TOTAL ANNUAL WATER REQUIREMENT (Kl/a)**  
Includes Measured Water Requirement, WSDP Projected Requirement, DWS's Reconciliation Strategy projections and the annual WWTW flows

