

Koringberg Distribution System - Input Variables for Water Requirement Model								
Parameter / Variable	Year	Income Categorization				Com. & Ind. (D)	Other(E)	Total
		HI	MI	LI	Sub- Total			
		Units are presented in brackets with the "Parameter Description" - First Column						
Population(A)	2016	274	1092	112	1477			
	2021	295	1235	267	1797			
	2026	318	1397	471	2186			
	2031	343	1581	737	2660			
	2036	369	1789	1079	3236			
	2041	398	2024	1516	3937			
Growth (%/year)		Growth in Population				Growth in Demand		
	2016-2021	1.50%	2.50%	19.07%	4.00%	4%	2%	
	2021-2026	1.50%	2.50%	12.04%	4.00%	4%	2%	
	2026-2031	1.50%	2.50%	9.35%	4.00%	4%	2%	
	2031-2036	1.50%	2.50%	7.93%	4.00%	4%	2%	
2036-2041	1.50%	2.50%	7.05%	4.00%	4%	2%		
Unit Demand (l/c/d)(B)	2016	110.0	80.0	50.0	-	-	-	-
Average Annual Daily Water Requirement (Kl/d - NRW Excluded)	2016	30	87	6		15	4	141
	2021	32	99	13		18	4	167
	2026	35	112	24		22	5	197
	2031	38	126	37		26	5	232
	2036	41	143	54		32	6	275
	2041	44	162	76		39	6	327
NRW (%) (C)	2016	14.7	14.7	14.7		14.7	14.7	
	2021	10.0	10.0	10.0		10.0	10.0	
	2026	10.0	10.0	10.0		10.0	10.0	
	2031	10.0	10.0	10.0		10.0	10.0	
	2036	10.0	10.0	10.0		10.0	10.0	
	2041	10.0	10.0	10.0		10.0	10.0	
Average Annual Daily Water Requirement (Kl/d)	2016	35	102	7		17	4	166
	2021	36	110	15		20	5	185
	2026	39	124	26		24	5	218
	2031	42	141	41		29	6	258
	2036	45	159	60		36	6	306
	2041	49	180	84		43	7	363
Average Peak Month Daily Water Requirement (Kl/d)	2016	70	203	13		34	9	328
	2021	71	217	29		39	9	366
	2026	77	246	52		48	10	432
	2031	83	278	81		58	11	511
	2036	89	315	119		70	12	606
	2041	96	356	167		86	14	718
Peak Day Water Requirement (Kl/d)	2016	87	253	16		42	11	410
	2021	89	272	37		49	12	458
	2026	96	307	65		59	13	541
	2031	104	348	101		72	14	639
	2036	112	393	148		88	16	757
	2041	120	445	208		107	17	898
Total Annual Water Requirement (Kl/year)	2016	12896	37365	2386		6247	1626	60520
	2021	13167	40067	5412		7204	1702	67552
	2026	14185	45332	9554		8765	1879	79715
	2031	15281	51289	14937		10664	2074	94246
	2036	16462	58029	21874		12974	2290	111630
	2041	17735	65655	30748		15785	2528	132451
Peak Month Factor(F)	1.98							
Peak Day Factor(G)	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 2016 to June 2017. Estimated 4.7 % 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 14.6 kl/d.
- (E) - Others: Calculated from Billed Metered Consumption data for the period July 2016 to June 2017. Average 3.8 kl/d.
- (F) - Peak Month Factor: Maximum value calculated from July 2012 to June 2017 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	Other Projections					Annual WWTW Flows (Estimated from Billed Metered Consumption Data)
			2% Annual growth on 2016/2017 Water Requirement	4% Annual growth on 2016/2017 Water Requirement	DWS's Reconciliation Strategy (February 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	62,809							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
2016	60,128	60,520	60,128	60,128	60,128	69,000	69,000	69,000
2021		67,552	66,386	73,155	85,200	87,800	90,400	90,400
2026		79,715	73,296	89,004	101,600	107,400	113,200	113,200
2031		94,246	80,924	108,287	120,800	131,000	141,400	141,400
2036		111,630	89,347	131,748	144,800	161,000	178,400	178,400
2041		132,451	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 2016 is therefore from July 2016 up to June 2017

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

