Annex – Leakage regression results

A1.1 Modelling results of WW models including leakage per sewer length as an additional explanatory variable (2017/18–2021/22) (CAC1 and CAC2)

Cost driver	Explanatory variable	WW1	WW2	WW3	WW4	WW5	WW6	WW7	WW8	WW9	WW10	WW11	WW12
Scale	Connected properties (log)	1.080*** {0.000}	1.061*** {0.000}	1.061*** {0.000}	1.049*** {0.000}	1.034*** {0.000}	1.017*** {0.000}	1.065*** {0.000}	1.050*** {0.000}	1.051*** {0.000}	1.043*** {0.000}	1.024*** {0.000}	1.011*** {0.000}
Complexity	Water treated at complexity levels 3 to 6 (%)	0.005* {0.096}		0.003 {0.356}		0.004 {0.356}		0.004** {0.042}		0.002 {0.507}		0.003 {0.423}	
	Weighted average treatment complexity (log)		0.655* {0.059}		0.454 {0.296}		0.546 {0.304}		0.574** {0.035}		0.285 {0.460}		0.443 {0.378}
Topography	Booster pumping stations per length of mains (log)	0.328*** {0.001}	0.288*** {0.001}	0.343*** {0.000}	0.320*** {0.001}	0.243 {0.234}	0.228 {0.241}						
	Average pumping head (log)							0.278*** {0.008}	0.247** {0.018}	0.299** {0.010}	0.281** {0.016}	0.173 {0.366}	0.153 {0.414}
Density	Weighted average density - LAD from MSOA (log)	-2.436*** {0.000}	-2.242*** {0.000}					-2.496*** {0.000}	-2.325*** {0.000}				
	Weighted average density - LAD from MSOA (log) squared	0.170*** {0.000}	0.154*** {0.000}					0.169*** {0.000}	0.155*** {0.000}				
	Weighted average density – MSOA (log)			-5.947*** {0.000}	-5.540*** {0.000}					-6.834*** {0.000}	-6.526*** {0.000}		
	Weighted average density – MSOA (log) squared			0.375*** {0.000}	0.347*** {0.000}					0.424*** {0.000}	0.403*** {0.000}		
	Properties per length (log)					-4.831 {0.176}	-3.549 {0.352}					-5.038 {0.118}	-4.049 {0.237}
	Properties per length (log) squared					0.567 {0.184}	0.41 {0.371}					0.572 {0.144}	0.451 {0.278}
Leakage	Leakage per km of mains	-0.093 {0.326}	-0.049 {0.632}	-0.092 {0.310}	-0.068 {0.497}	-0.058 {0.583}	-0.029 {0.793}	-0.06 {0.569}	-0.026 {0.811}	-0.092 {0.385}	-0.075 {0.502}	-0.048 {0.653}	-0.025 {0.823}
Constant	Constant	-0.928 {0.498}	-1.794 {0.235}	14.454*** {0.001}	12.708*** {0.006}	1.279 {0.859}	-1.569 {0.843}	-2.570* {0.078}	-3.142** {0.039}	15.919*** {0.000}	14.733*** {0.005}	0.564 {0.937}	-1.526 {0.839}
Model robustness tests and additional information													
Statistical diagnostic tests	R-squared	0.975	0.974	0.971	0.970	0.961	0.960	0.973	0.972	0.969	0.967	0.959	0.958
	RESET test	0.872	0.964	0.962	0.988	0.947	0.770	0.508	0.656	0.364	0.425	0.806	0.816
Model information	Estimation method	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE	RE
	Observations	85	85	85	85	85	85	85	85	85	85	85	85
	Dependent variable	Wholesale water botex plus network reinforcement						Wholesale water botex plus network reinforcement					

Source: AWS based on Ofwat's modelling suite.

A1.2 Modelling results of TWD models including leakage per sewer length as an additional explanatory variable (2017/18–2021/22) (CAC1)

Cost driver	Explanatory variable	TWD1	TWD2	TWD3	TWD4	TWD5	TWD6
Scale	Length of mains (log)	1.104*** {0.000}	1.049*** {0.000}	1.092*** {0.000}	1.096*** {0.000}	1.045*** {0.000}	1.081*** {0.000}
Topography	Booster pumping stations per length of mains (log)	0.331*** {0.000}	0.308*** {0.001}	0.307 {0.109}			
	Average pumping head TWD (log)				0.338*** {0.000}	0.393*** {0.000}	0.319*** {0.005}
Density	Weighted average density - LAD from MSOA (log)	-3.199*** {0.000}			-3.292*** {0.000}		
	Weighted average density - LAD from MSOA (log) squared	0.251*** {0.000}			0.252*** {0.000}		
	Weighted average density – MSOA (log)		-6.378*** {0.000}			-7.065*** {0.000}	
	Weighted average density – MSOA (log) squared		0.440*** {0.000}			0.478*** {0.000}	
	Properties per length of mains (log)			-15.610*** {0.000}			-15.934*** {0.000}
	Properties per length of mains (log) squared			1.969*** {0.000}			1.985*** {0.000}
Leakage	Leakage per km of mains (log)	-0.165 {0.211}	-0.095 {0.494}	-0.145 {0.299}	-0.136 {0.273}	-0.091 {0.425}	-0.142 {0.283}
Constant	Constant	4.227*** {0.004}	17.984*** {0.000}	25.109*** {0.000}	2.216 {0.148}	18.117*** {0.000}	23.652*** {0.000}
Model robustness tests and additional information							
Statistical diagnostic tests	Adjusted R-squared	0.965	0.961	0.968	0.970	0.972	0.975
	RESET test	0.661	0.985	0.674	0.179	0.155	0.288

Source: AWS based on Ofwat's modelling suite.

A1.3 Modelling results of leakage-related TWD models including leakage per sewer length as an additional explanatory variable (2017/18–2021/22) (CAC2)

Cost driver	Explanatory variable	TWD1	TWD2	TWD3
Scale	Length of mains (log)	1.532*** {0.000}	1.440*** {0.000}	1.450*** {0.000}
Density	Weighted average density - LAD from MSOA (log)	-6.685*** {0.000}		
	Weighted average density - LAD from MSOA (log) squared	0.493*** {0.000}		
	Weighted average density – MSOA (log)		-13.514*** {0.000}	
	Weighted average density – MSOA (log) squared		0.885*** {0.000}	
	Properties per length of mains (log)			-11.828 {0.116}
	Properties per length of mains (log) squared			1.560* {0.098}
Leakage	Leakage per km of mains (log)	-0.419 {0.394}	-0.365 {0.421}	-0.455 {0.330}
Constant	Constant	8.516** {0.012}	38.742*** {0.001}	8.8 {0.477}
Model robustness tests and additional information				
Statistical diagnostic tests	Adjusted R-squared	0.921	0.9	0.873
	RESET test	0.598	0.901	0.494

Source: AWS based on Ofwat's modelling suite.