

## Supplementary material

**Table S1. Overview of data for the geological models**

Category	Data type	Source	The geological model that utilized the data
Hydrostratigraphical model (V0)	3D layer model in GeoScene	Sandersen and Kallesøe (2017)	V0, V1, V2
Urban infrastructure	Sewer network	Vandcenter Syd A/S (2019a)	V1, V2
	Water supply pipes	Vandcenter Syd A/S (2019b)	V1, V2
	District heating pipes	Fjernvarme Fyn (2019)	V1, V2
	Gas pipes	Danish Gas Distribution (2019)	V1, V2
	Roads and railways	Danish Geodata Agency (2019)	V1, V2
	Road build-up material	Vejdirektoratet (2019)	V1, V2
	Railway build-up material	Nielsen (2016)	V1, V2
	Buildings and basements	Odense Kommune (2019)	V1, V2
Soil material	Soil mail	Jakobsen et al. (2022)	V2
	Shallow geotechnical boreholes	Geological surveys of Denmark and Greenland (GEUS) (2019)	V2

**Table S2. The hydrological model versions, their difference in geological model and computational grid size, and calibration setup.**

Hydrological model	Geological model input	Horizontal resolution of the computational grid (m)	Calibration setup			
			No. of free parameters	No. of tied parameters	Target /acceptable $\Phi_m^t / \Phi_m^a$	Achieved $\Phi_m / \Phi_t$
V0_50	V0	50	8	7	27 / 29	27/35
V0_10	V0	10	7	23	52 / 54	52/54
V1_50	V1	50	7	23	52 / 55	52/54
V1_10	V1	10	8	7	27 / 28	28/28
V2_50	V2	50	7	23	55 / 58	55/57
V2_10	V2	10	7	23	36 / 38	35/38