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URBAN DRAINAGE AND FLOODPLAIN STORAGE EVALUATION USING 3D TOOLS

Lucija Kursite[1], Inga Grinfelde[1,2] and Jovita Pilecka-Ulcugaceva[1]

[1] Faculty of Forest and Environmental Sciences, Latvia University of Life Sciences and Technologies, Latvia
[1] Faculty of Environmental Engineering, Lietuvos Inzinerijos Kolegija Higher Education Institution, Lithuania

KEY RESULT

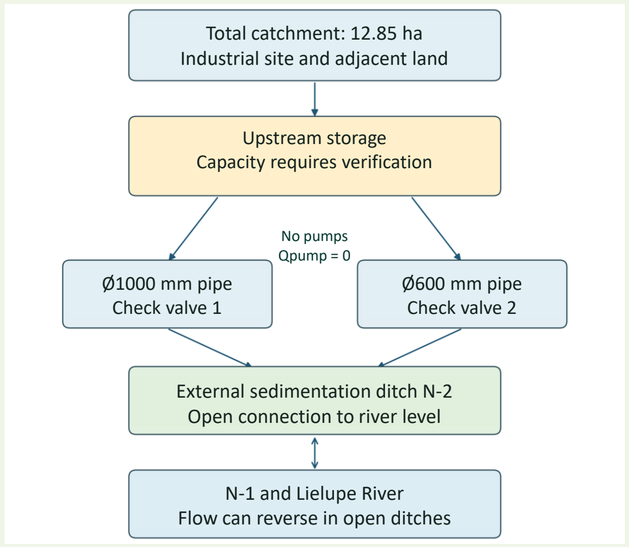
In a geometry test, raising only the permanently submerged bed removed about 1,123 m³ of permanent water volume while leaving incremental storage unchanged in 79 tested level pairs. Upper geometry and hydraulic connections remained unchanged.

SITE AND DRAINAGE SYSTEM



Open drainage beside the Lielupe River. Site photograph reproduced from the report cover. [1]

G2 FLOW PATHS



Conceptual diagram, not to scale. When valves close, external river-connected water space cannot store runoff upstream of the wall. [1, §3.1]

SCENARIOS AND METHODS

G0 Pre-construction terrain

Four LAS sources provide a 1 m grid. Submerged-bed gaps remain NoData.

G1 Approved wetland design

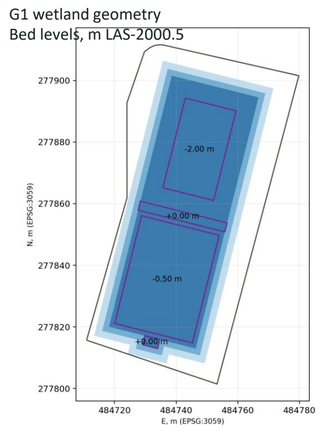
Parametric geometry from design drawings. Deep bed −2.00 m, shallow bed −0.50 m. Pumping is part of the design.

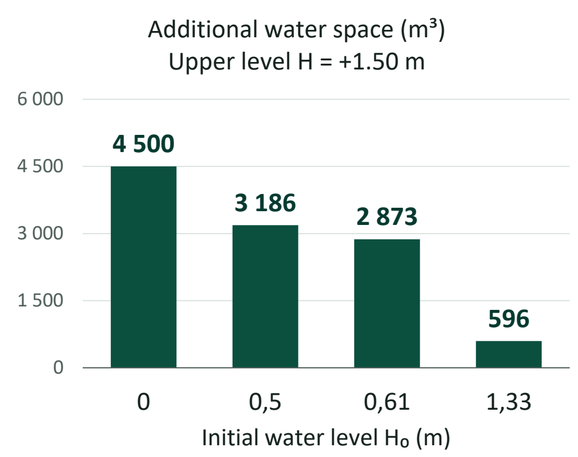
G2 As-built system

Surveyed banks support a partial terrain surface. Two pipe check valves, no pumps. [1, §§3, 5–7]

Compare the same footprint, water levels and hydraulic loading.

PERMANENT WATER AND EVENT STORAGE





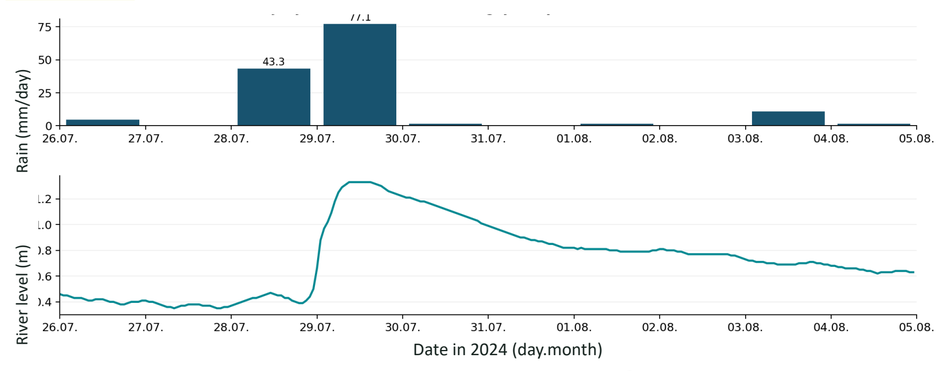
G1 fixed external wetland footprint. V(H) − V(H_0) gives the geometric increment above the initial level. It does not establish protected-side operating storage. [1, §6.1; Fig. 2]

CONTROLLED BED-RAISING TEST

1,123 m³	79	≈0 m³
PERMANENT VOLUME REMOVED	TESTED WATER-LEVEL PAIRS	CHANGE IN INCREMENTAL STORAGE

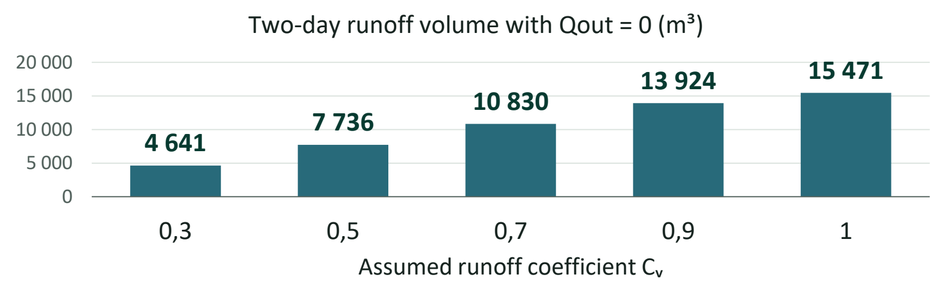
Only bed elevations below −0.50 m were raised. $H_0 \geq 0.00$ m, with the same upper geometry and connections. This control is separate from actual G2. [1, §6.2]

OBSERVED RAINFALL AND RIVER LEVEL



28–29 July: 120.4 mm rain over 12.85 ha gives 15,471.4 m³ gross rainfall volume. Daily rain and hourly river levels have different time support. [1, §9; Fig. 4]

CONDITIONAL ZERO-OUTFLOW TEST

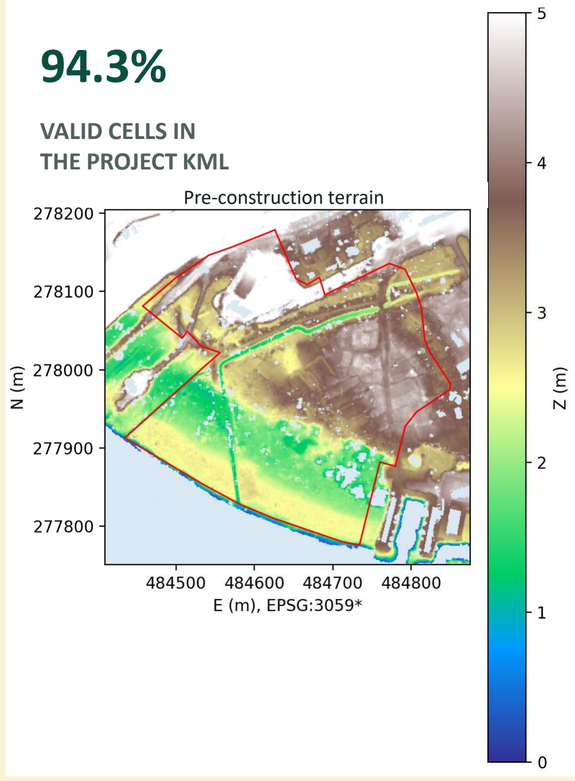


A sensitivity test, not an observed flood volume. River-connected external storage cannot substitute for upstream storage while valves remain closed. [1, §9.1]

G0 TERRAIN EVIDENCE

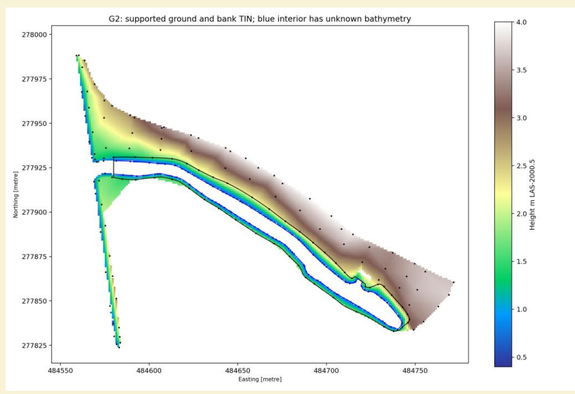
94.3%

VALID CELLS IN THE PROJECT KML



Red outline: project KML, distinct from the 12.85 ha catchment. Unknown terrain remains NoData. Elevation scale in metres. [1, §5; Fig. 1]

G2 SURVEYED BANKS



176 accepted ground/bank elevations support the partial surface. The submerged ditch bed remains unknown. [1, §7; Fig. 3]

OPERATIONAL IMPLICATIONS

The expert assessment supports retaining the open system under normal gravity drainage, with working valves and maintained connections. Monitor both sides of the outlets and assess prolonged closure separately. [1, §§15–16]

SCOPE OF THE FINDINGS

A full transient G0/G1/G2 model was not run. Treatment performance was not measured. [1, §§12–16]