

Contents

Introduction

Chapter 1 Localities in the Czech Elbe containing sediments loaded by old pollution

- 1.1 Locality of the Les Království reservoir
- 1.2 Locality of Pardubice-port
- 1.3 Space behind dikes and spurs of the trained Elbe channel between Mělník and Lovosice

Chapter 2 Research problems in the Les Království reservoir

- 2.1 Method of radar search of sediment layers
- 2.2 Computation of volumes of sediment components
- 2.3 Research on sediment quality in the Les Království reservoir
- 2.4 Catastrophic flood in the Les Království reservoir
- 2.5 Computation of water head in the reservoir during the catastrophic flood Q_{500}
- 2.6 Estimation of the process of re-suspension of sediments in the Les Království reservoir
- 2.7 Mathematical modelling of sedimentation in the flood plane due to a catastrophic flood going through the Les Království reservoir – assumptions
- 2.8 Implementation of the sedimentation module into the FAST 2D model
- 2.9 Results of numerical simulation of sedimentation
- 2.10 Modelling the effect of pollution percolating from new sediments in the flood plain to subsoil and ground water
- 2.11 Description of the site and hydro-geological conditions of the flood plain where sedimentation was modelled
- 2.12 Conceptual model of heavy metal flux to the underground body – prepositions
- 2.13 Description of conceptual model of heavy metal flux
- 2.14 Input data
- 2.15 Discretization of modelling prepositions, initial parameters, boundary conditions and calibration of the groundwater flow model
- 2.16 Results of modelling of heavy metal flux from settled sediments to ground water of the Jaroměř flood plain
- 2.17 Conclusions of the complex research on the Les Království site

Chapter 3 Mineral oils in sediments of Pardubice-port and their possible re-suspension

- 3.1 Hydrology of the Elbe and Jesenčanský brook and properties of sediments in Pardubice-port
- 3.2 Critical combination of discharges in the Elbe and Jesenčanský brook
- 3.3 Simulation of the effect of combination of both flows on sediments
- 3.4 Flow simulation for Jesenčanský brook
- 3.5 Flow simulation for the Elbe main channel in combination with flood flows in Jesenčanský brook
- 3.6 Amount of eroded sediments at variants of above mentioned discharges
- 3.7 Estimate of velocities in the port at the discharges higher than Q_{100}
- 3.8 Transport of polluted sediments from Pardubice-port – conclusions

Chapter 4 Modelling of the effect of pollution brought by new sediments to water bearing horizon of the Lovosice water treatment plant

- 4.1 Introduction to problems of the effect of new sediments brought by a catastrophic flood to the flood plain
- 4.2 Modelling of sedimentation in the site of Lovosice during catastrophic floods
- 4.3 Hydrological background of simulation of sedimentation
- 4.4 Sedimentation in the Lovosice locality simulated by the upgraded FAST 2D model
- 4.5 Influence of settled sediments on groundwater – introduction
- 4.6 Description of the site and hydro-geological conditions of the flood plain where sedimentation was modelled
- 4.7 Conceptual model
- 4.8 Model descriptions
- 4.9 Input data
- 4.10 Discretization, initial parameters, boundary conditions and calibration
- 4.11 Results
- 4.12 Conclusions

5 Overall conclusions

References

Souhrn