MoST

Monitoring Sea-water intrusion in coastal aquifers and Testing pilot projects for its mitigation

MITIGATION STRATEGIES TO REDUCE SALTWATER INTRUSION
ISES PROJECT (Saltwater Intrusion and Land Subsidence) year 2003

Saltwater contamination depth map

LAGUNA DI VENEZIA

Pilot test area
Saltwater flows from venice lagoon to test study area basin
THE MAIN PALEO-RIVERS OF ADIGE AND PO
INTAKE STRUCTURE

Canal Morto river  water level 10,25 m
Pipe intake level 9,65 m

Pipe Ø280 mm

Outflow level 8,35 m
Pipe out take level 8,16 m

Provincial road no.7

Water levels $\Delta = 1,90$ m
INTAKE STRUCTURE

SEZIONE A - A

2 gate valves DN 300 mm

PIANTA

Concrete walls

H = 3.84 m

12 driven piles
DRAINAGE SYSTEM
DRAINAGE SYSTEM

Injection of freshwater with drains
DRAINAGE SYSTEM

Injection of freshwater with drains
CANAL LOCKS «PORTE VINCIANE»
CUT-OFF WALL

CUT OFF WALL – DIAPHRAGM
H = 8 m

Bacchiglione river
Venice lagoon
Brenta river
Canal Morto channel
CUT-OFF WALL

Diaphragm wall
L=200 m, H= 8 m
PRELIMINARY NUMERICAL ANALYSIS
Starting condition

(15° January 2012)

(1° June 2012)

(1° January 2013)
Simulation results after 2 years
1.5 m in depth (reference system -2 m a.s.l) , 1° January 2017
Simulation results after 3 years
1.5 m in depth (reference system -2 m a.s.l), 31° December 2018

(kg/m3)
Simulation results after 2 years
3.5 m in depth (reference system -2 m a.s.l, 1\° January 2017)
Simulation results after 3 years
3.5 m in depth (reference system -2 m a.s.l, 31° December 2018)
Simulation results after 2 years
7.5 m in depth (reference system -2m a.s.l, 1° January 2017
Simulation results after 3 years
7.5 m in depth (reference system -2m a.s.l), 31° December 2018
Random Field Generation

Setup for laboratory experiment

Experimental canal in DICEA Hydraulic Laboratory
Random Field Generation

Setup for laboratory experiment

Hydraulic canal in DICEA Hydraulic Laboratory