

# MULTI-STAKEHOLDER APPROACH TO CHARACTERIZING AND REMEDIATING THE PFAS-CONTAMINATED SITE IN NORTHERN EUROPE

*Michele Remonti,*  
Principal Consultant |ERM



ERM



CONVEGNO  
**Assoreca**  
ASSOCIAZIONE AMBIENTE . ENERGIA  
SICUREZZA . RESPONSABILITÀ SOCIALE

**OSSERVATORIO PFAS ASSORECA**  
RIFLESSIONI PER UN APPROCCIO  
METODOLOGICO

19.09.2024 | H 14.00

---

**REMTECH EXPO 24**  
FERRARA FIERE

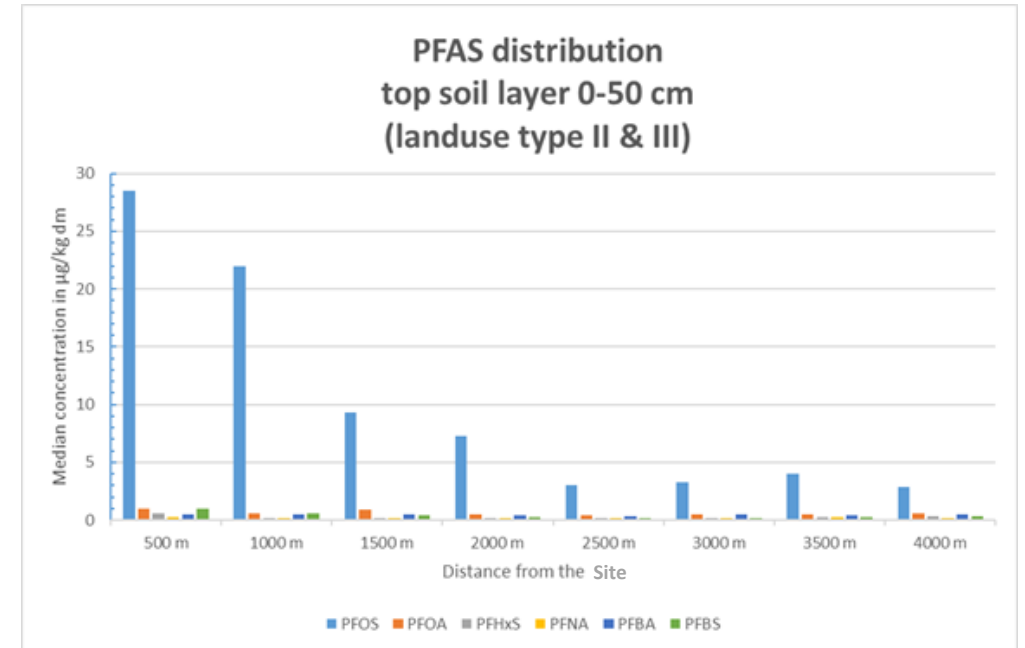
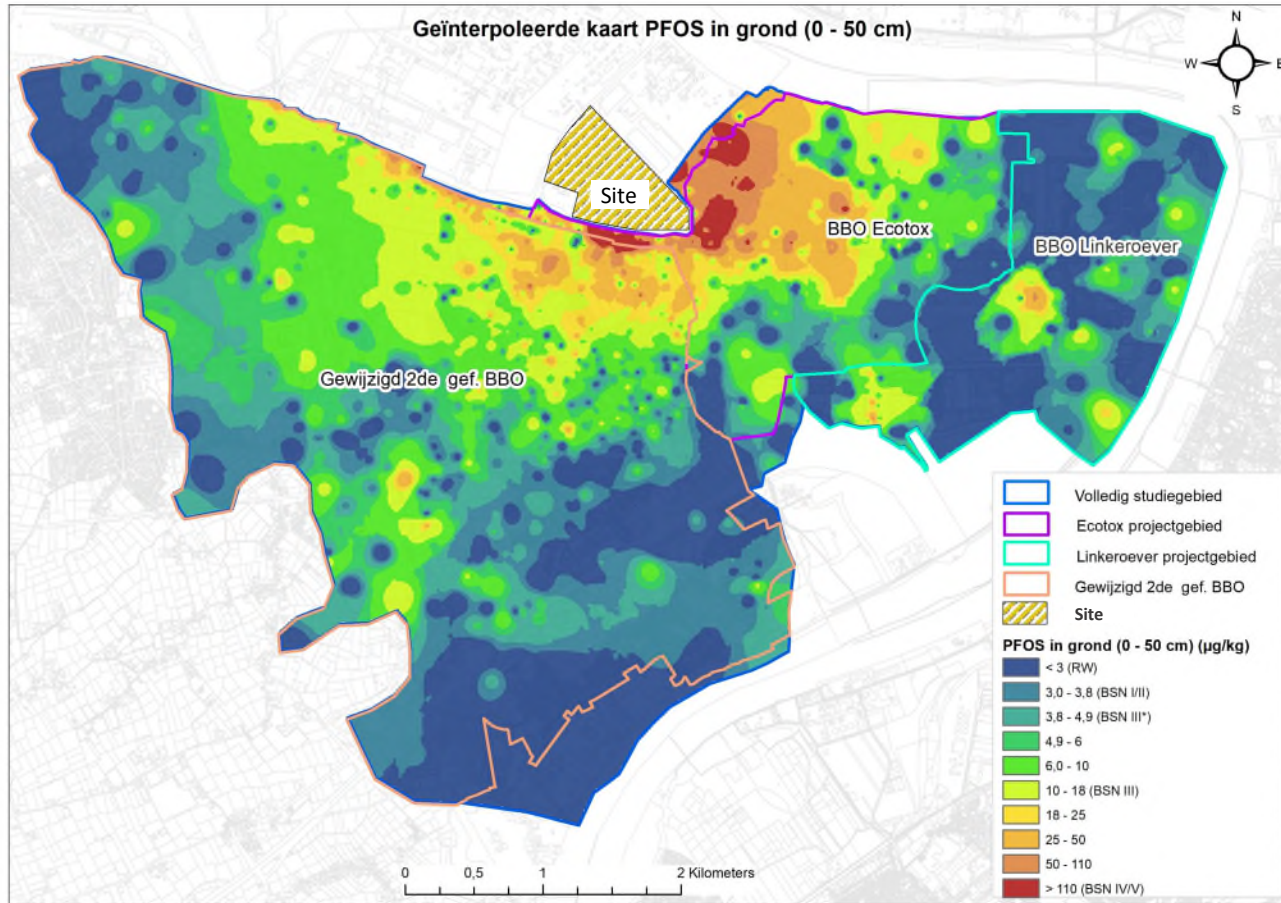
PFAS



REMTECH EXPO  
FERRARA FIERE



# PFOS distribution in topsoil (and groundwater)

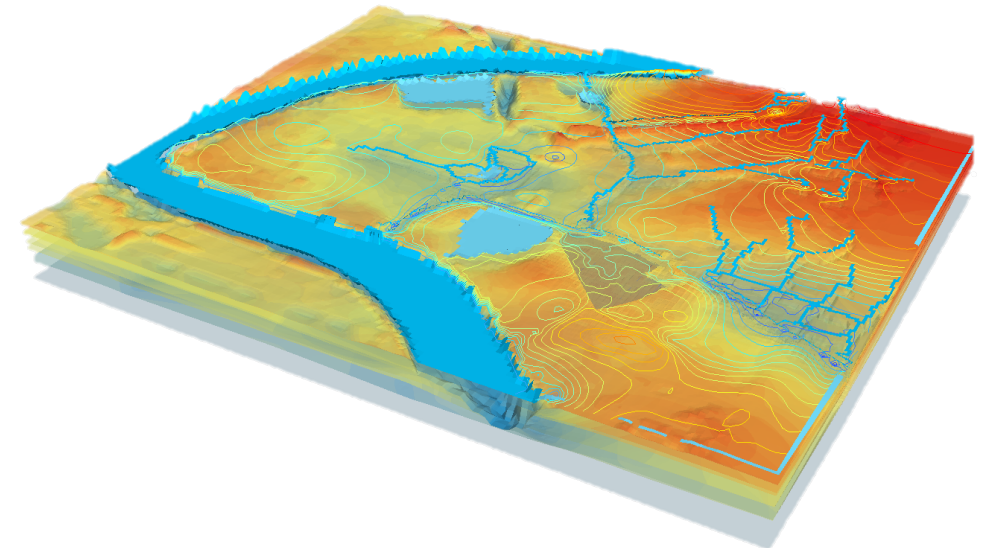
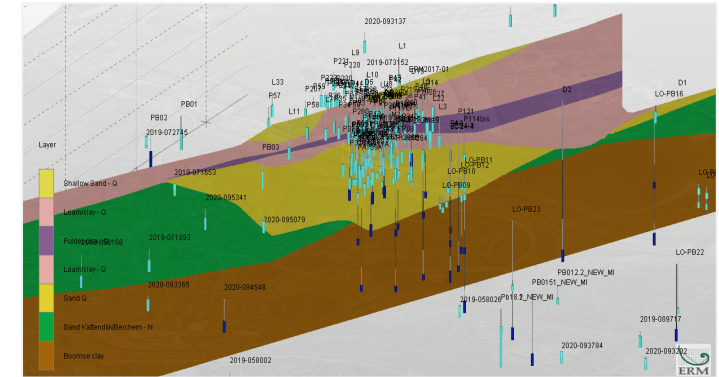


# Seeking societal approval : What the stakeholders were saying when starting the RAPs development



# Internal area RAP: hydrogeological modelling as strategic management tool

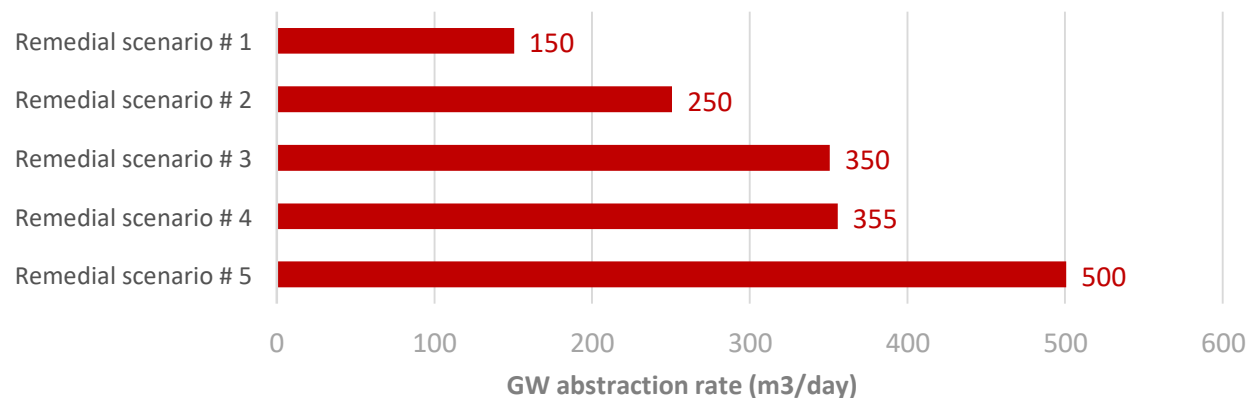
- **State-of-the-art, large-scale, numerical flow and PFAS transport model has been created as comprehensive management tool to assist in the definition of the site remedial actions**
- The main objective of the model were:
  - improve and validate the Conceptual Site Model
  - guide new hydrogeological data acquisition
  - understand the details of GW flow and contaminant migration
  - support the design of remediation and containment actions through predictive scenarios in a sustainability framework



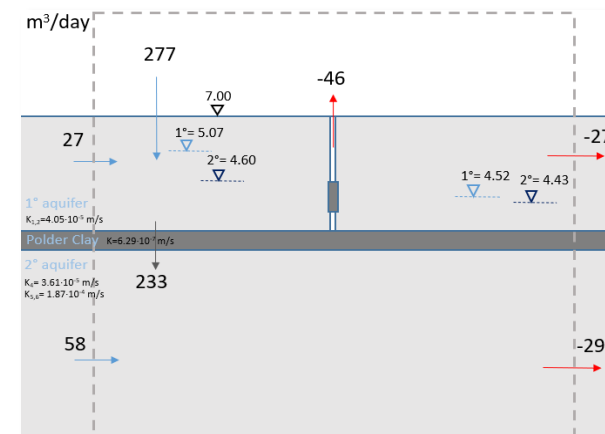
# Groundwater remedial scenarios and sustainability evaluation

- Various predictive scenarios have been simulated to define the **most effective and sustainable remedial approach**
- The simulated scenarios comprise **different combination of various remedial technologies, such as hydraulic confinement, capping, and physical barriers**
- The sustainability is evaluated in terms of environmental and economic impact of each remedial scenario using cost/benefit approach, with the assumption that every solution should be 100% effective in groundwater containment

## Preliminary results of remedial technologies sustainability evaluation

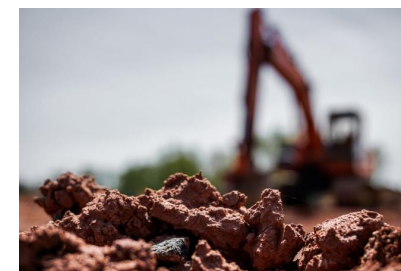


## Mass balance of complex remedial scenarios



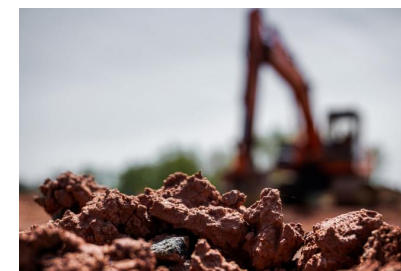
# External areas RAP: main actions

- 70 cm soil exchange residential/agricultural area;
- Treatment/disposal of the excavated PFAS containing soils;
- Backfill with good quality soils, fertile top layer;
- Restoration of the residential gardens;
- Anticipated duration of the works 4 to 5 yrs, subject to backfill material/treatment capacity and agreements with the property owners.



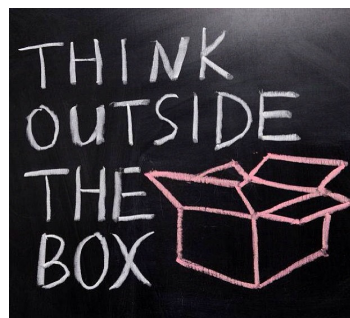
# Challenges to overcome

- Evolving policy & regulatory framework
- Biomonitoring results (blood serum) had to be integrated in the initial RAP addressing human tox risk
- PFAS framework in continuous evolution
- Human risk mainly driven by consumption of free-range chicken eggs
- Extremely short RAP development time imposed <6 months
- Remedial works will be intrusive for the involved people
- Many stakeholders involved with different interests





# Co-creation is the only way to go



# Thank you



Jan Van Linden

Associate Partner

ERM Belgium

jan.vanlinden@erm.com

+32 473 873 604

Michele Remonti

Principal Consultant

ERM Italia

michele.remonti@erm.com

+39 349 0514251



Osservatorio PFAS

19 settembre 2024

