



Phytoscreening of BTEX and chlorinated solvents by tree coring

Nielsen, Mette Algreen; Broholm, Mette Martina; Trapp, Stefan; Kalisz, Mariusz; Krupanek, Janusz; Stalder, Marcel; Martac, Eugeniu

Publication date:
2014

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Nielsen, M. A., Broholm, M. M., Trapp, S., Kalisz, M., Krupanek, J., Stalder, M., & Martac, E. (2014). *Phytoscreening of BTEX and chlorinated solvents by tree coring*. Abstract from 9th International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California, United States.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Phytoscreening of BTEX and chlorinated solvents by tree coring

Mette Algreen (mann@env.dtu.dk) Mette Broholm, Stefan Trapp (Technical University of Denmark, Kgs. Lyngby, Denmark), Mariusz Kalisz, Janusz Krupanek (Institute for Ecology of Industrial Areas, Katowice, Poland), Marcel Stalder (SolGeo AG, Solothurn, Schweiz), Eugeniu Martac (Fugro Consult GmbH, Mössingen, Germany).

Background/Objectives. Site characterization is often time consuming and a financial burden for the site owners, which raises a demand for rapid and inexpensive screening methods. Tree coring is a phytoscreening method useful for detection of contamination with organic compounds. The method takes advantage of the natural ability of trees to absorb water, nutrients and prospective contaminants from the soil pore water into their roots and upwards to the stem from where a core is sampled. Samples are then analyzed for the contaminants in the wood. The results give an impression of the contaminant level in the subsurface and plumes may be mapped. Various plants can be used for phytoscreening, however trees are preferable to smaller plants as their large root system can absorb chemicals from a broader and deeper area.

Approach/Activities. In this study tree coring is tested for fuel components and chlorinated solvents. The method was applied at various European sites contaminated with PCE/TCE or BTEXs due to former site activities (industrial production, gas stations, air base or gas plant). Tree core samples were collected in fall 2013 and analyzed by HS-GC/MS. Results were used to map the plume(s). The measured concentrations are also compared to concentrations detected in soil and/or groundwater. Furthermore, the two screening technologies Tree coring and Soil air sampling have been compared to evaluate the feasibility of the tree coring method.

Results/Lessons Learned. The method of tree coring can detect contamination with BTEX and chlorinated solvents in the shallow subsurface. The uptake of BTEX into trees varies to a greater extent with the site conditions and tree species than chlorinated solvents, which lead to greater uncertainty.

Tree coring is semi-quantitative, low-invasive and inexpensive, which makes it suitable as initial screening methods. The method is useful at large sites and at sites where conventional site characterization methods can be limited due to the sensitivity of the site (e.g. private land, moor, rocks and forest) or due to (former) activities at the site like explosive hazard which poses a risk when drilling. Phytoscreening by tree coring can be used to focus other more advanced and cost-intensive screening methods, with the overall goal to make site characterization more complete and/or efficient.