Region Hovedstaden

REGION

Clients view on the dynamic approach

Short course: Dynamic approach for investigation at contaminated sites

NORDROCS 2012. Tuesday 18. september 2012.

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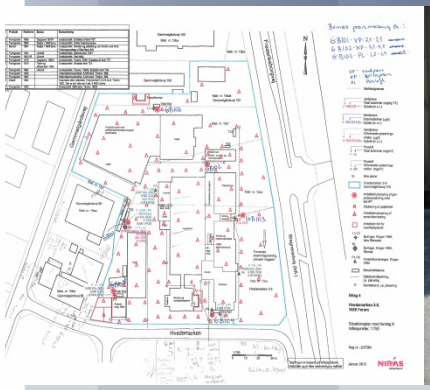

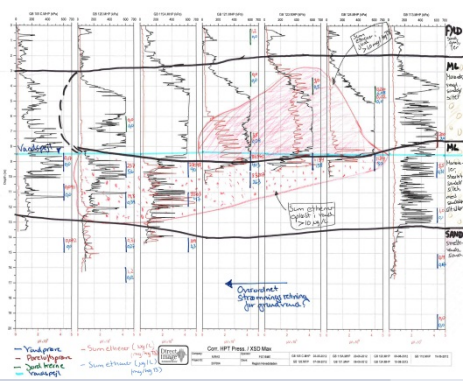

Clients view on the dynamic approach

Motivation for using the dynamic approach

Case

General experience

Conclusion

Motivation for using the dynamic approach

Expectations of:

- More efficient investigations
- Better risk assessment and delineation of the contaminated area
- Shorter period of time with disturbance for the owner of the property
- Same economy, but more data at the same price

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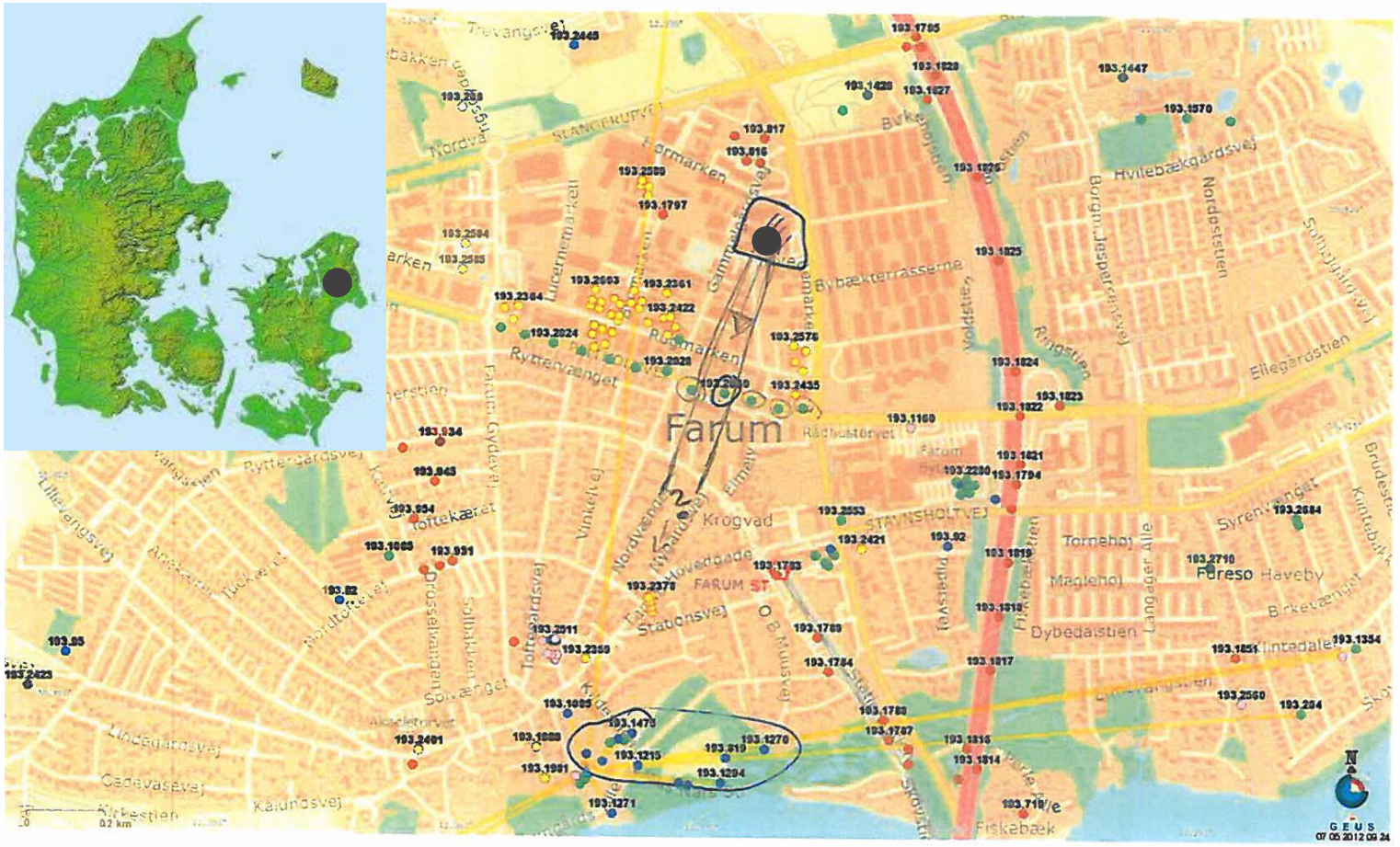
Case · Hvedemarken 3-5/Gammelgårdsvej 102



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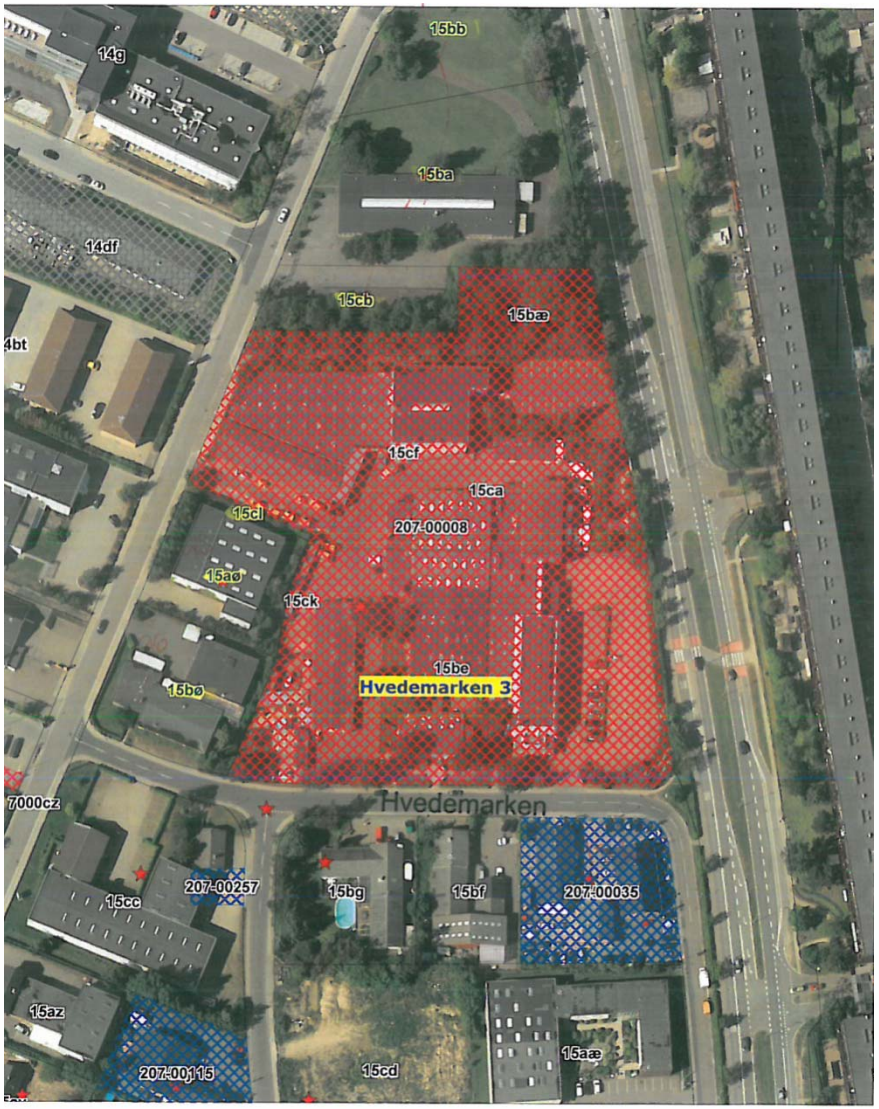

Case · Hvedemarken 3-5/Gammelgårdsvej 102
Planed activities 1. phase

- Gathering of historical information about the activities
- TV-inspection of sewers
- 6 MIHPT combined with cores and sampling of level specific groundwater
- Screening of soil vapor combined with a IR-measurement – 180 places
- Mobile laboratory analyzed samples using the DSITMS method

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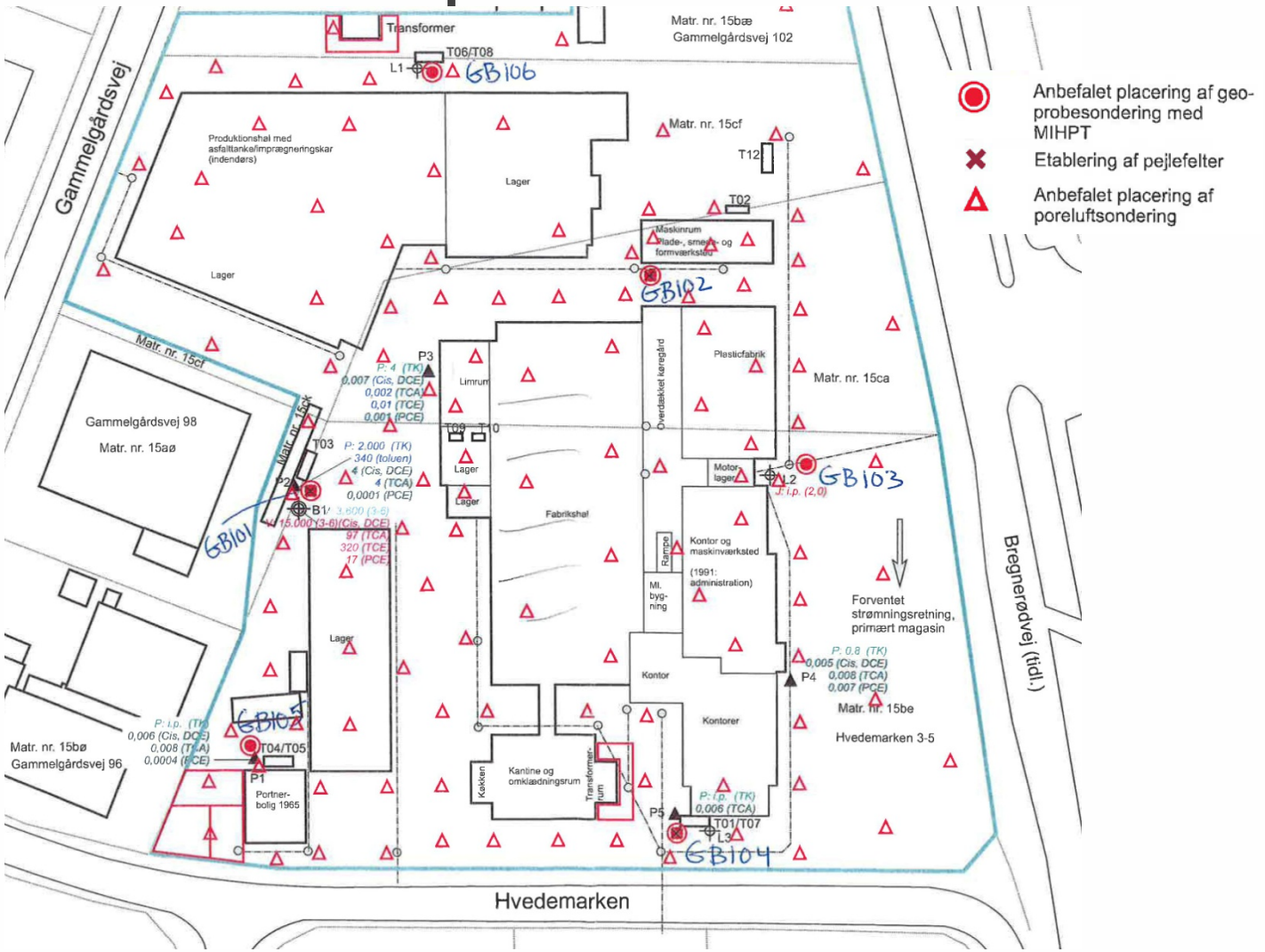
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Planed activities 1. phase



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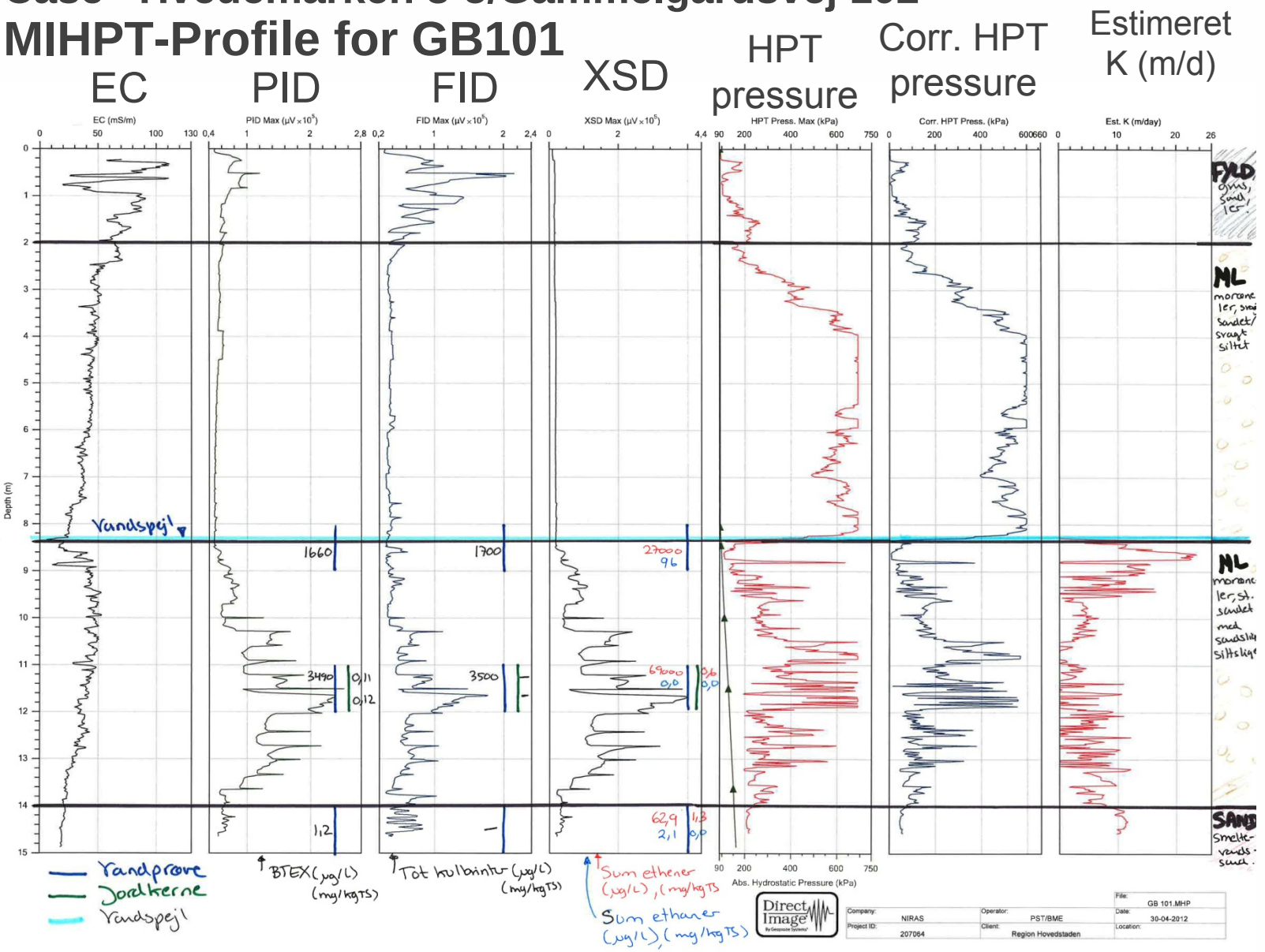
Case · Hvedemarken 3-5/Gammelgårdsvej 102

MIHPT-Profile for GB101



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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Day 1 Screening of soil vapor: PID-data

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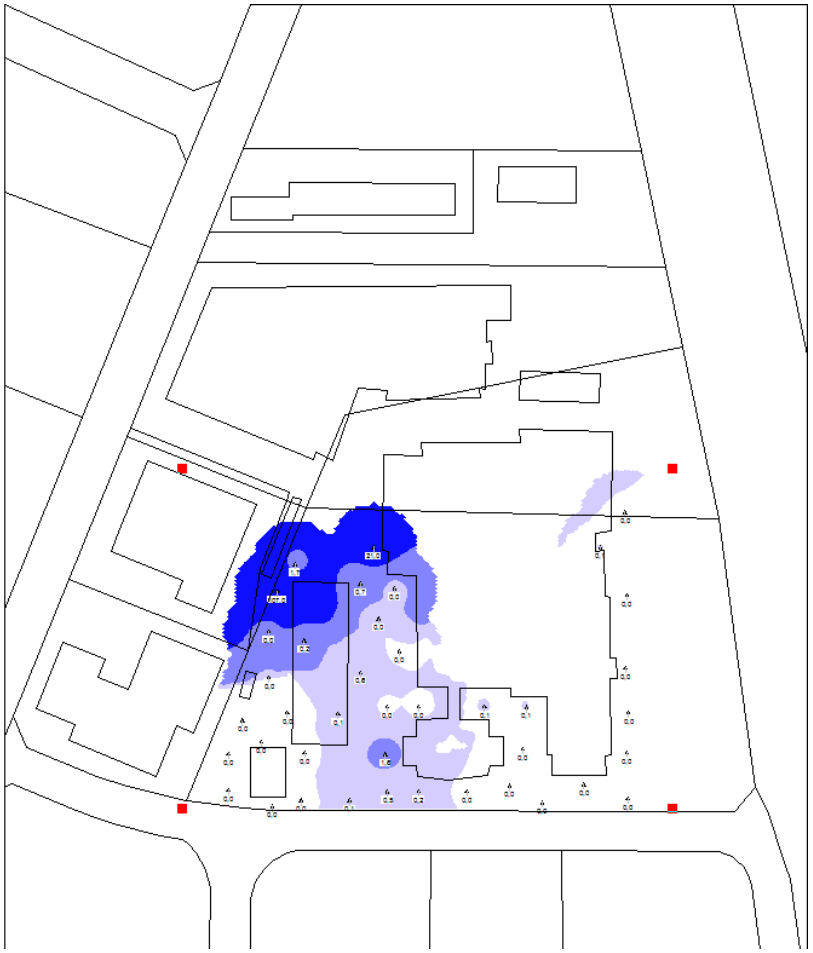
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Day 2 Screening of soil vapor



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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Day 3 Screening of soil vapor

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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Day 4 Screening of soil vapor

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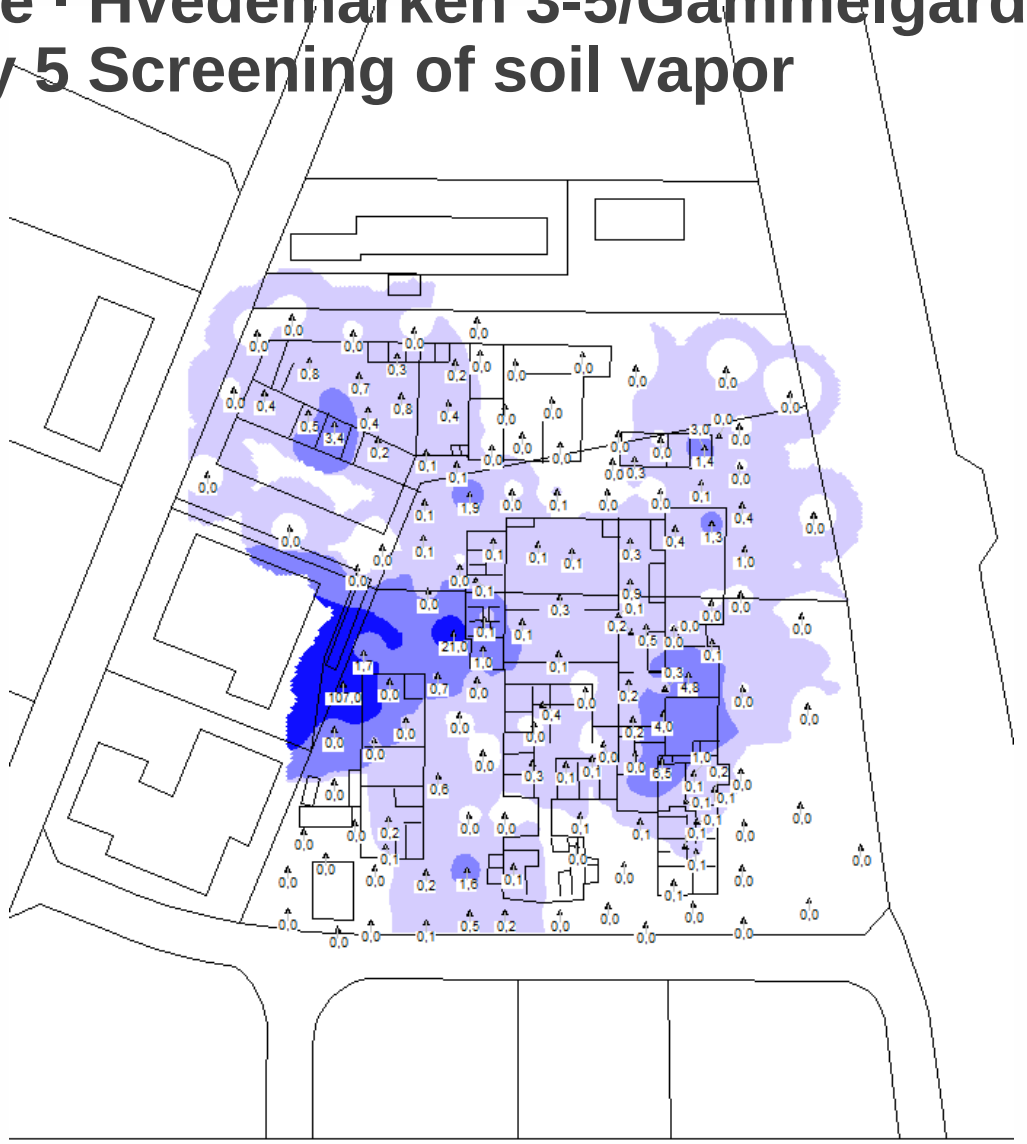
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Day 5 Screening of soil vapor



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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Day 6-9 Screening of soil vapor

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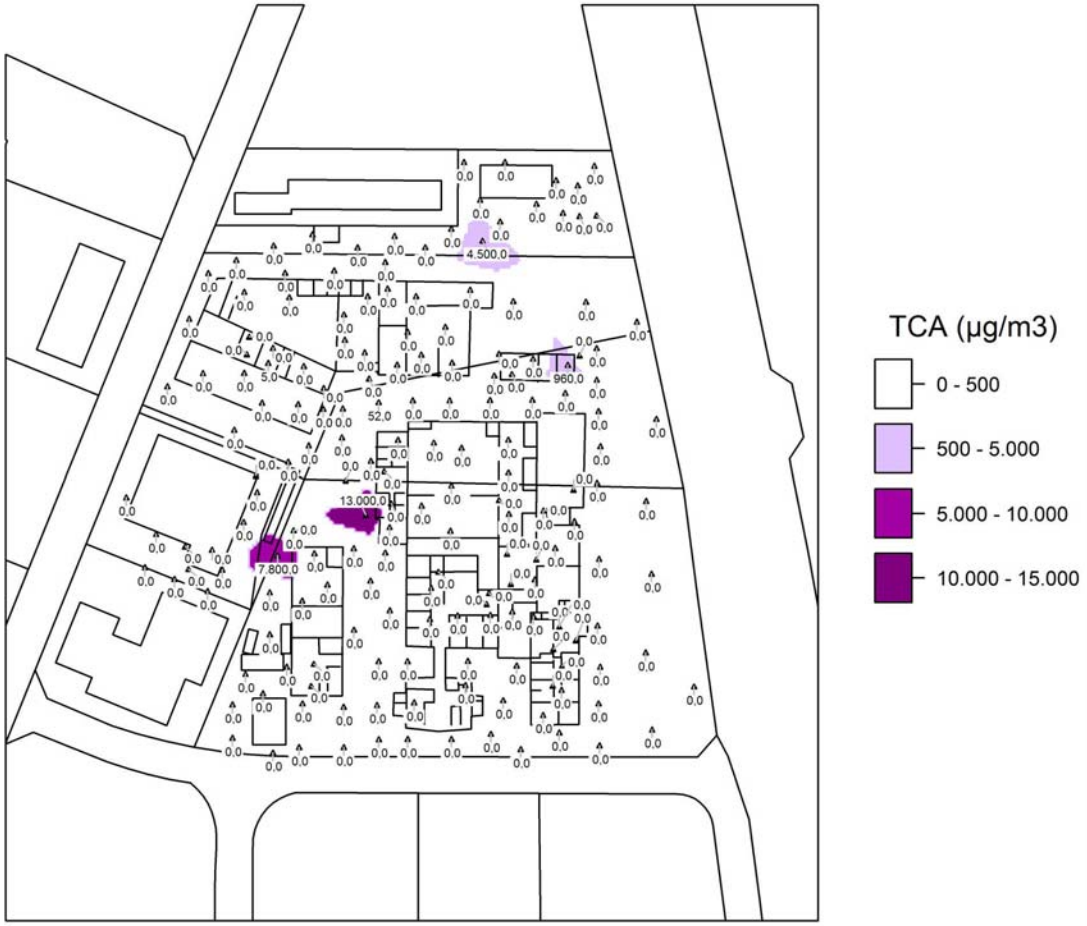
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · BTEX

Region Hovedstaden

Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · PCE

Region Hovedstaden

Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · TCA



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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · TCE

Region Hovedstaden

Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · DCE

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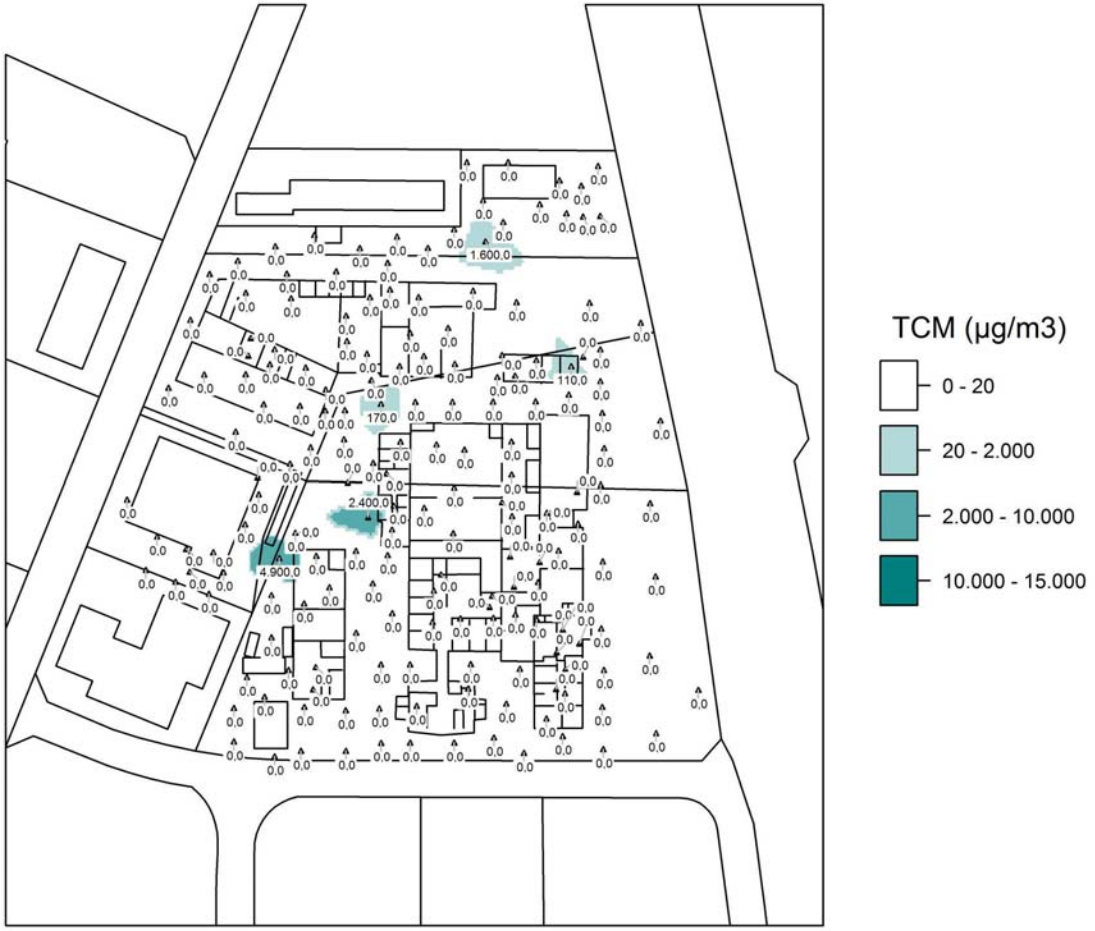
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · TCM



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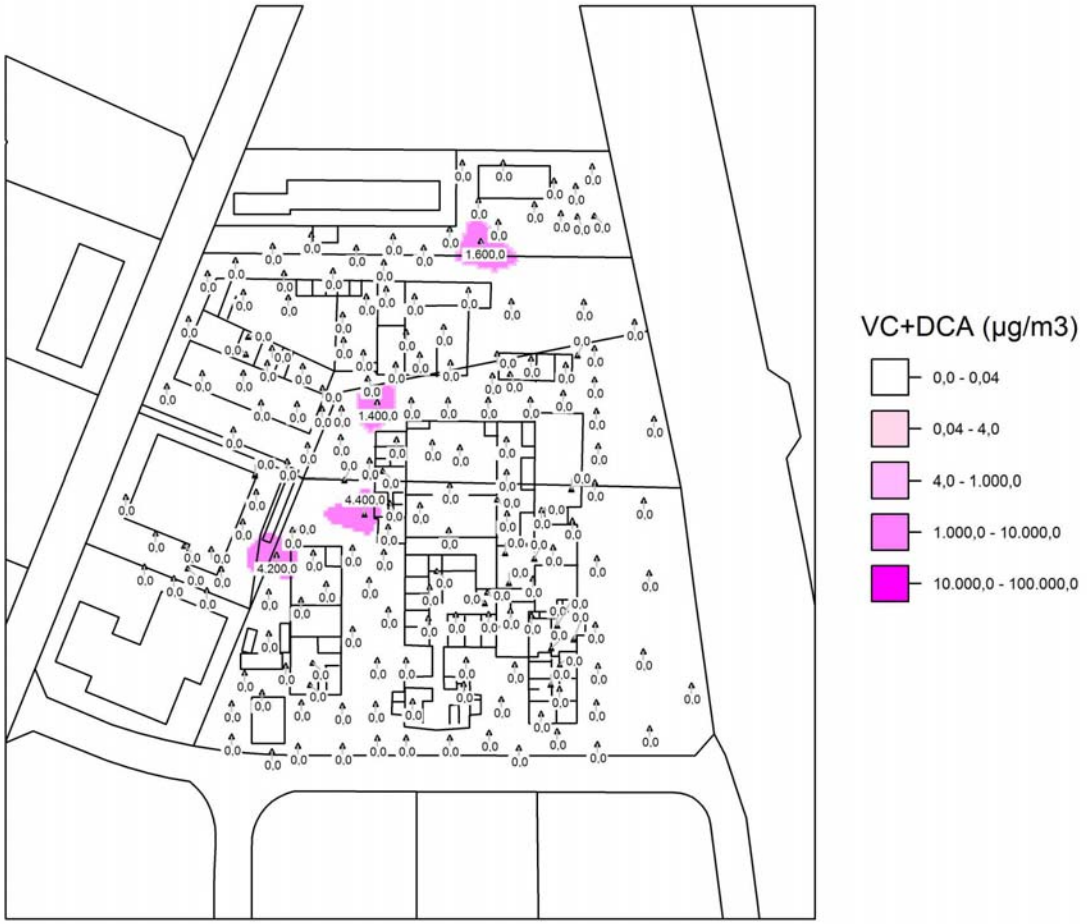
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor · VC+DCA



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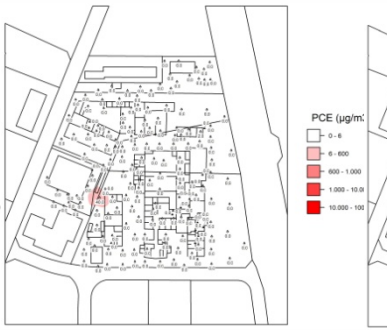
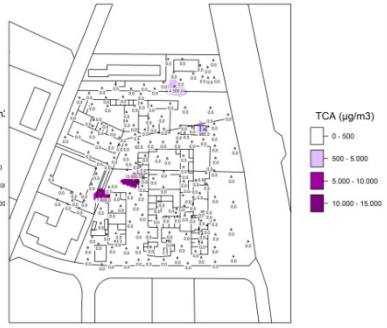
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor

BTEX

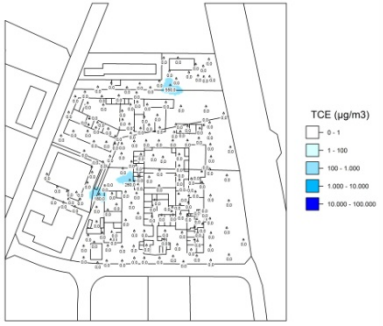
PCE



TCA

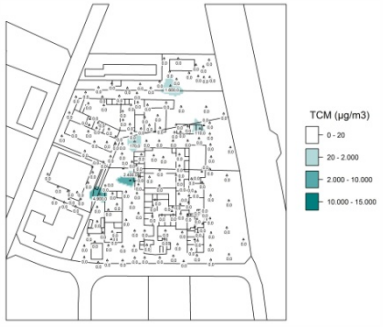


TCE

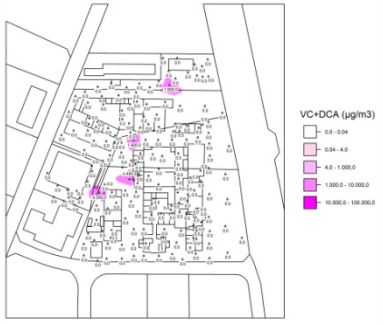


DCE

TDM



VC+DCA



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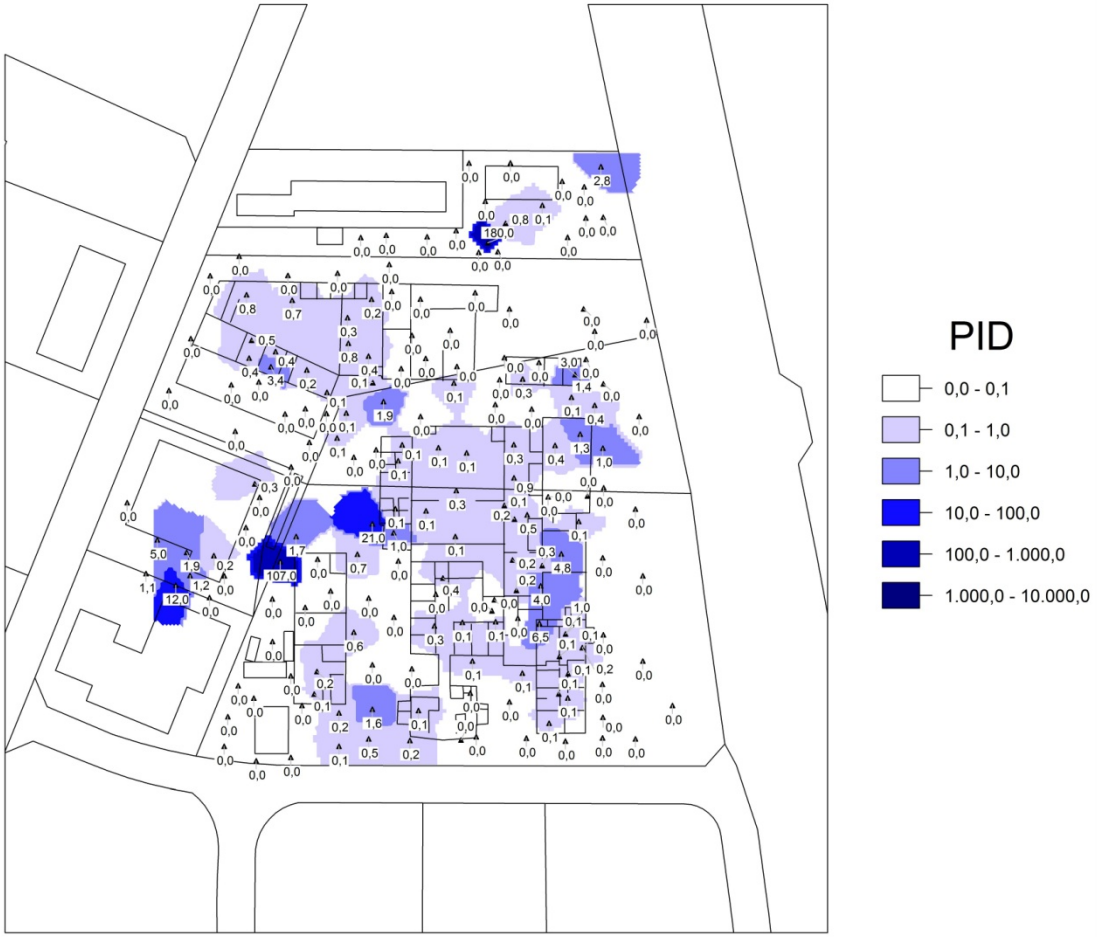
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor



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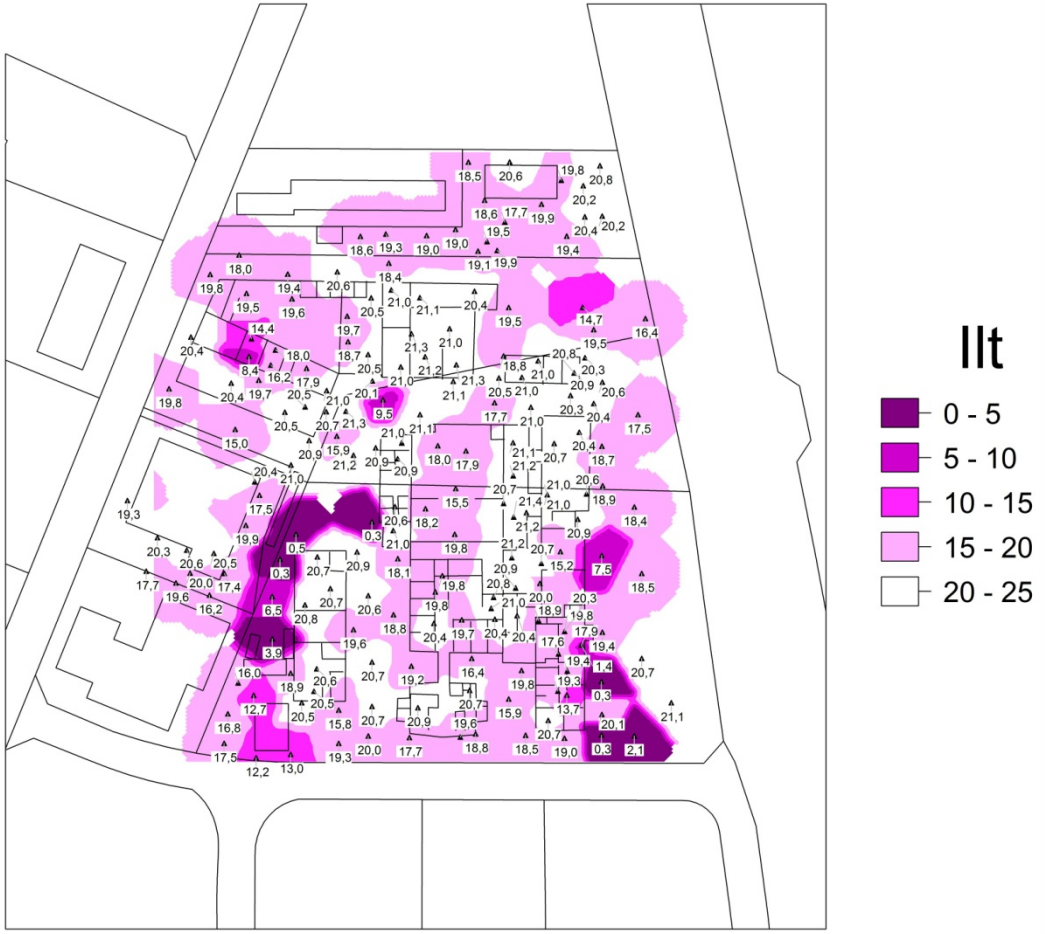
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor



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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Results of screening soil vapor

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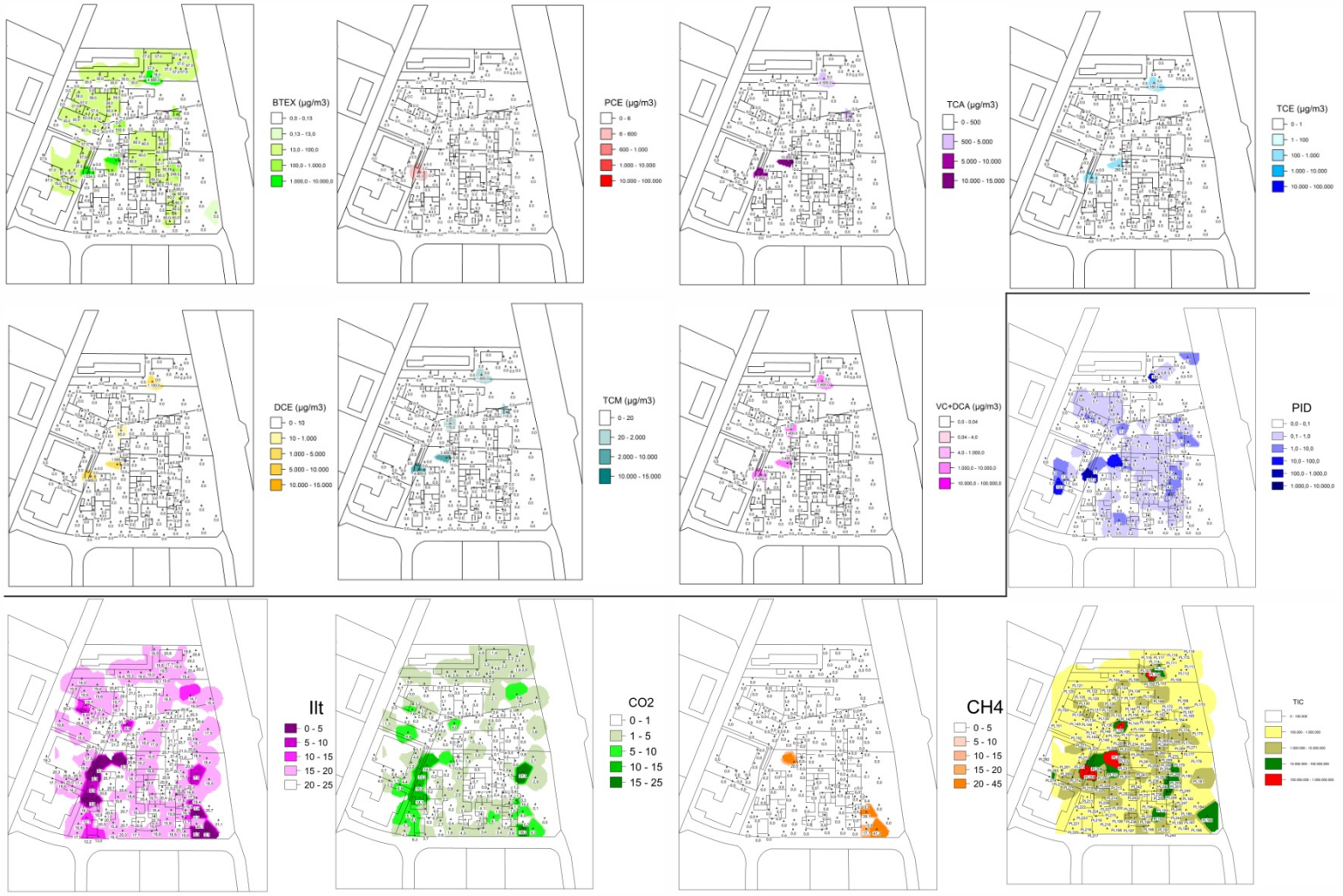
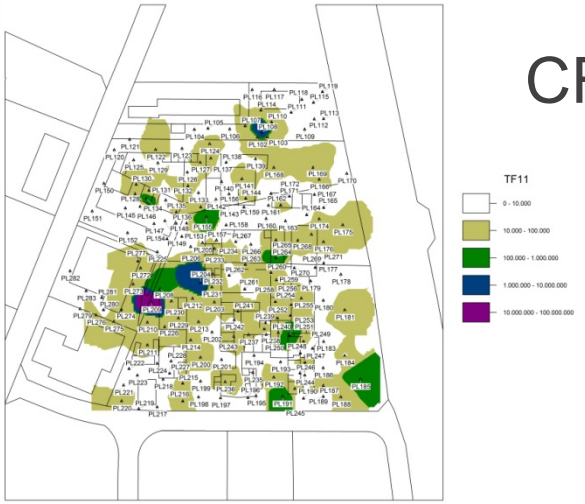


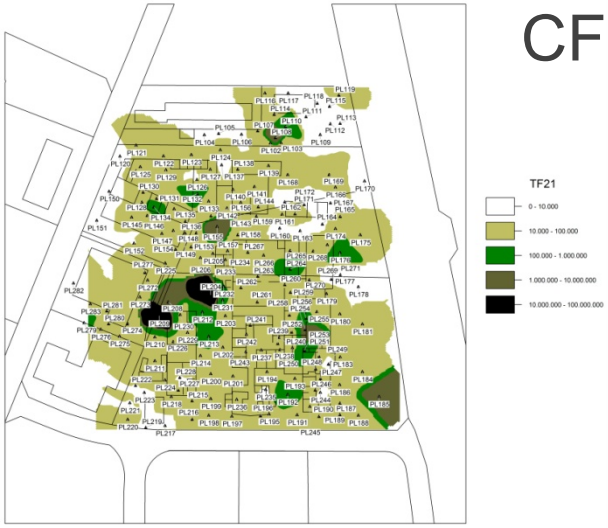
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Freon compounds

CFC-11

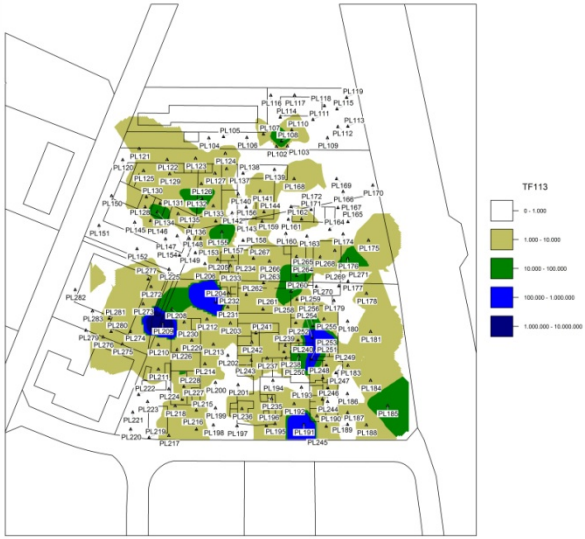


CFC-12

CFC-21



CFC-113



Case · Hvedemarken 3-5/Gammelgårdsvej 102
Status after the 1. phase

- Several possible hot-spot areas
- Level of contamination was very high and many components were found in GB101 including chlorinated compounds and oil compounds
- Freon in the deep soil vapor at the south part of the site

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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Plan for 2. phase

5 MIHPT placed at possible hot-spots

3 deep soil vapor samples and level specific water sampling

3. phase planned while the 2. phase was conducted

- find the source area near GB101
- could ventilation be a suitable remediation method

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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Plan for 2. and 3. phase

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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Section with MIHPT-probing

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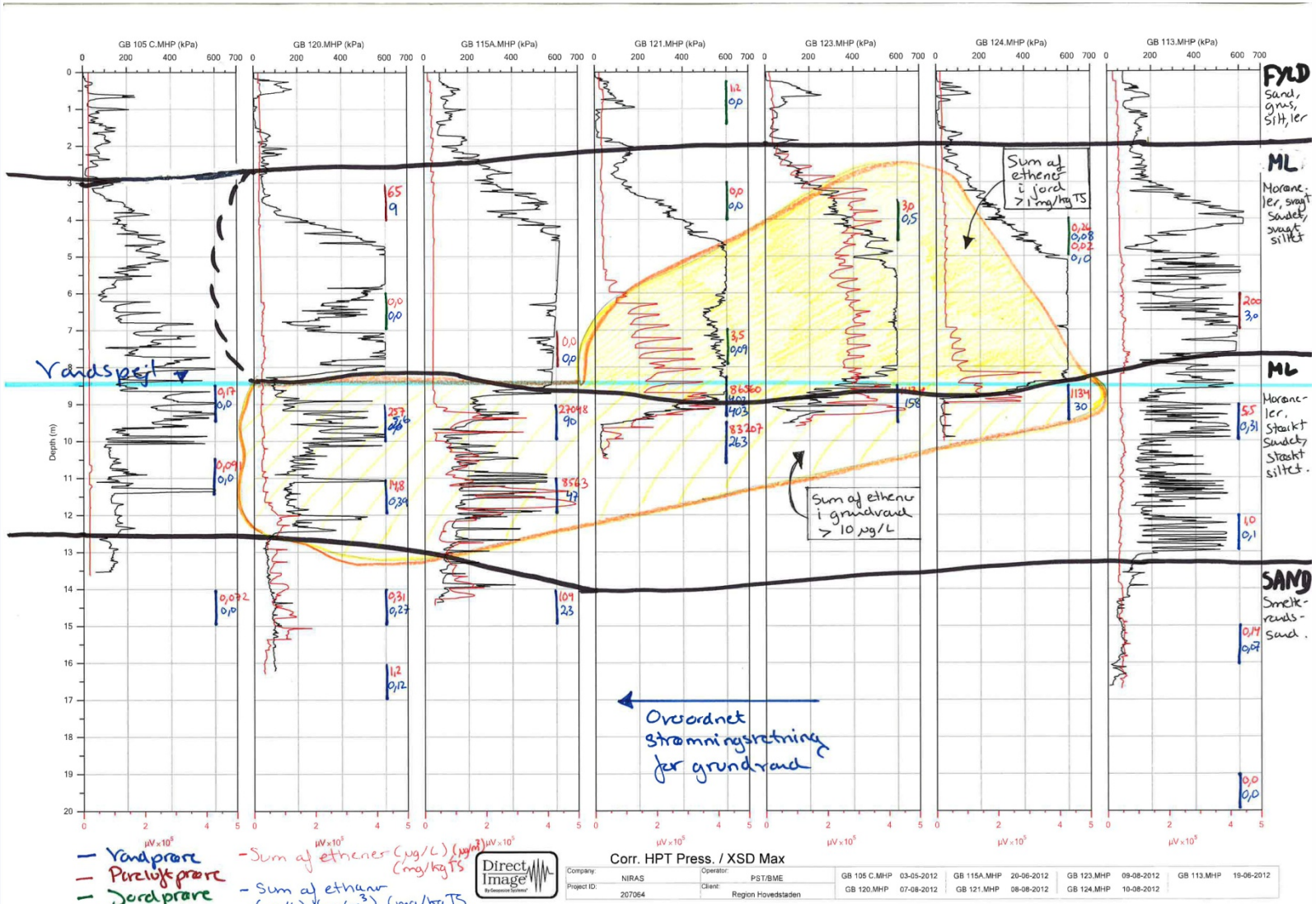
Case · Hvedemarken 3-5/Gammelgårdsvej 102
Section with MIHPT-probing



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Case · Hvedemarken 3-5/Gammelgårdsvej 102
Planned activities

- Get an overview of the results of all the data collected
- Indoor air quality measurements in residential properties in October
- Delineate source of contamination consisting of chlorinated and Freon compounds
- Decide if we will investigate the possible contamination on neighbor property
- Remediation program for the hot-spots

Case · Hvedemarken 3-5/Gammelgårdsvej 102

Combination of screening of soil vapor for contaminants with IR measurements have helped to locate hot-spot that we would not have found otherwise

DSITMS-lab is a broad spectra analysis and discovered other contaminants (freon) than those we focused on from the start

MIHPT has given a more qualified sampling of soil, soil vapor and water samples, and the hydraulic conductivity is determined

Many data points gives a better understanding of the contamination situation and will ultimately provide a more reliable risk assessment

Time spent is significantly shorter than in traditional investigations

Region Hovedstaden

Experience with 20 investigation in the Capital Region

- Process
- Field methods
- Analysis
- Time-consumption
- Economy

General experience · Process · Planning

Make sure the site is suitable for using the dynamic approach

- expectation of large number of measurement points
- the need for quick results
- measuring depths should be shallow
- desire for detection the source by screening
- detailed study of the source areas

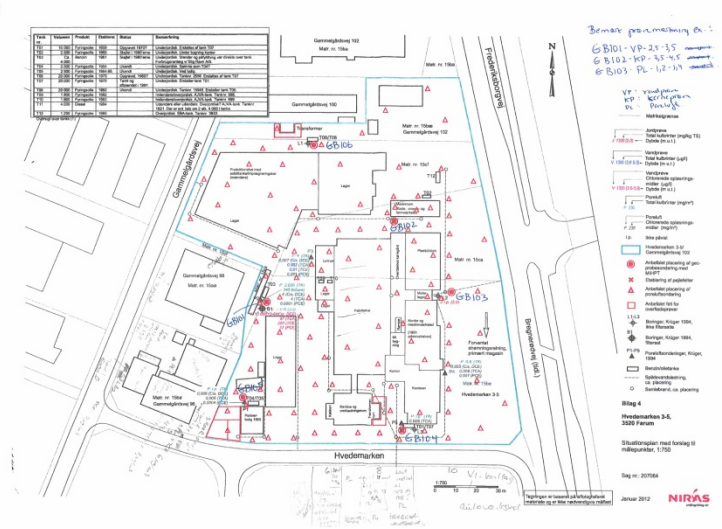
Region Hovedstaden

General experience · Process · Planning

•Think the strategy carefully through

•Experienced consultants in the field to help make quick decisions

•Landowners informed about the presence of a large number of fieldworkers and equipment



General experience · Process · Planning

Tender

- Define the scope of the assignment - hotspot, plume

- Consider the need for analysis - can the field-laboratory analyze the desired contaminant?

General experience · Process · Planning

Evaluation of tenders

- Is the timing and choice of methods realistic
- Which detection limits can be achieved and is it good enough for the purpose of the investigation?
- Procedure for daily calibration of laboratory equipment

General experience · Process · Planning

- Permanent contact person at both the consultant and the region
- Make sure you are available when the fieldwork is in progress – set time aside in your calendar
- Daily communication
- Key project-members from both the consultant and the Capital Region should participate in the inspection
- Contact neighbors in advance if its likely that the delineation of contamination will involve them

General experience · Process · Planning

Agree on how the data is to be presented during the fieldwork

- All results gathered in one drawing
- 2D-drawing works fine to illustrate results and MIHPT-profiles in the first phase
- To maintain an overview in the next phase a specific sectioning or a complete 3D-model is necessary
- With more complicated contaminations a meeting when appropriate could be considered

General experience · Process · During fieldwork

•Decisions must be made quickly on the basis of recommendations from consultant

•Recommendations from the consultant should be priced according to unit prices in the contract

General experience · **Process** · Report

Challenging to put the many different types of data together graphically

More data and knowledge of the hydraulic conductivity for better risk assessment and better delineation of contamination

Remember to get documentation for daily quality assurance of field analysis - as long as the methods are “new”

Generel experience · Dynamic field methods

MIHPT gives a more qualified sample selection and we get correlated data of geology, the hydraulic conductivity and pollution parameters

DSITMS detects a broad spectrum of contaminants

IR measurements of soil vapor complements other methods of finding hot-spot and contaminated areas

When using several methods and having more data points, the investigation becomes more reliable

General experience · Analysis

•We demand that 20% of the samples are submitted to an accredited laboratory

• Good accordance between the field laboratory and the accredited laboratory for the chlorinated compounds, while for oil-components there is a difference

The difference may be caused by:

•The in homogeneity of soil samples

•Samples of soil vapor is collected in different ways

General experience · Time

- The total investigation duration is shorter
- More intense time-consumption in the planning of the investigation and while field work is taking place
- Total time consumption is believed to be reduced
- Needs to be available daily
- Additional sampling may extend the process
- Faster clarification for the landowner

General experience · Economy

- The same level of expenses compared to traditional investigations
- Lower costs per data point – more quality
- The total budget is used up over a short time period

General experience

- Time spent is significantly shorter than in traditional investigations
- Prices is at the same level as using traditional investigations
- The dynamic field methods provide more qualified sampling and certainty in order to find the source of contamination
- More data points provides a better description of the contaminant distribution and risk assessment becomes more reliable

Conclusion

We will continue to use the dynamic approach for investigation of contaminated sites, improve the concept and test new field methods