



# CityChlor by a case

16.11.2010

Peter von Schnakenburg

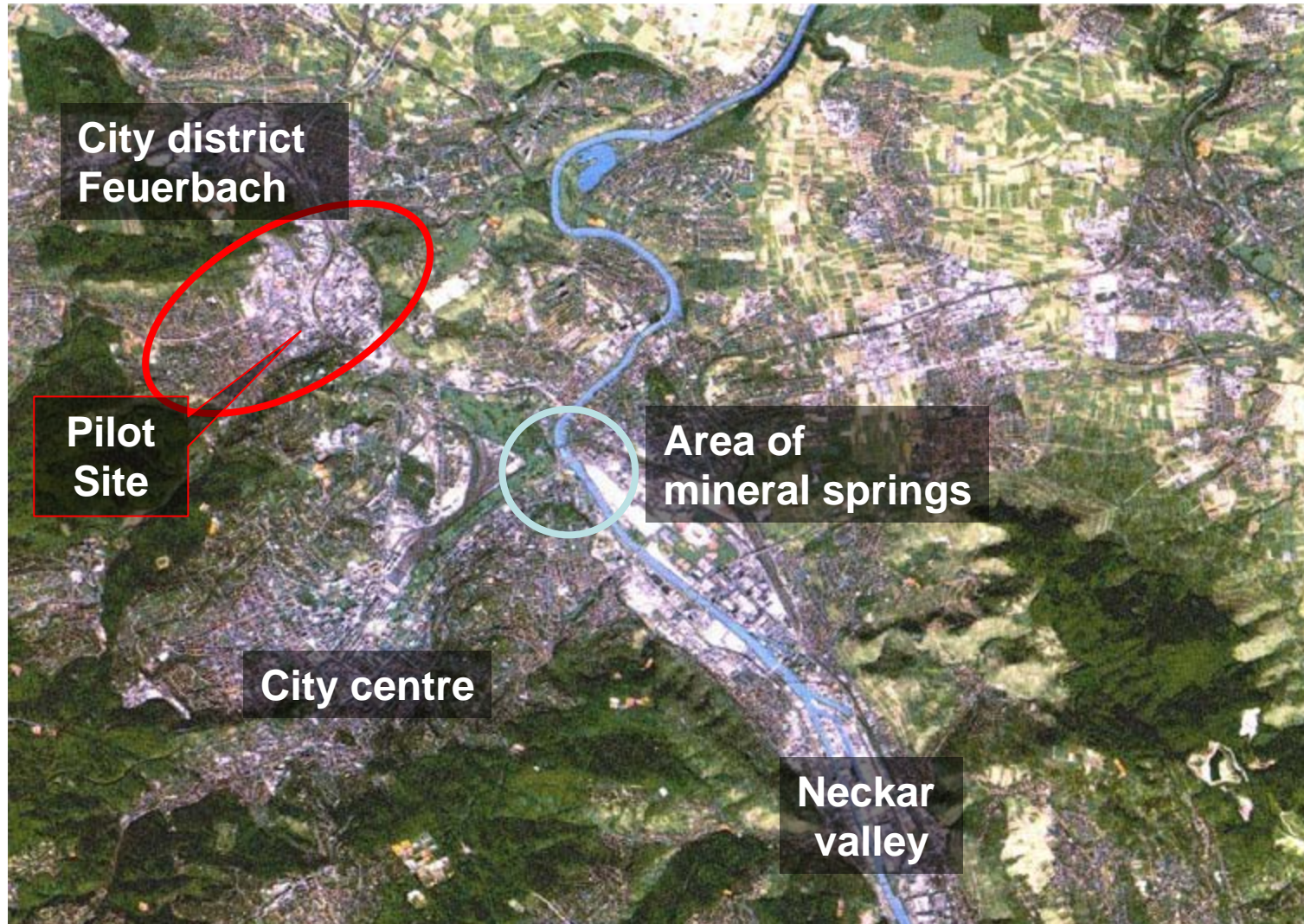
Department for Environmental Protection,  
City of Stuttgart Stuttgart



**STUTTGART**



# Aerial View on Stuttgart




# CityChlor pilot site in Stuttgart



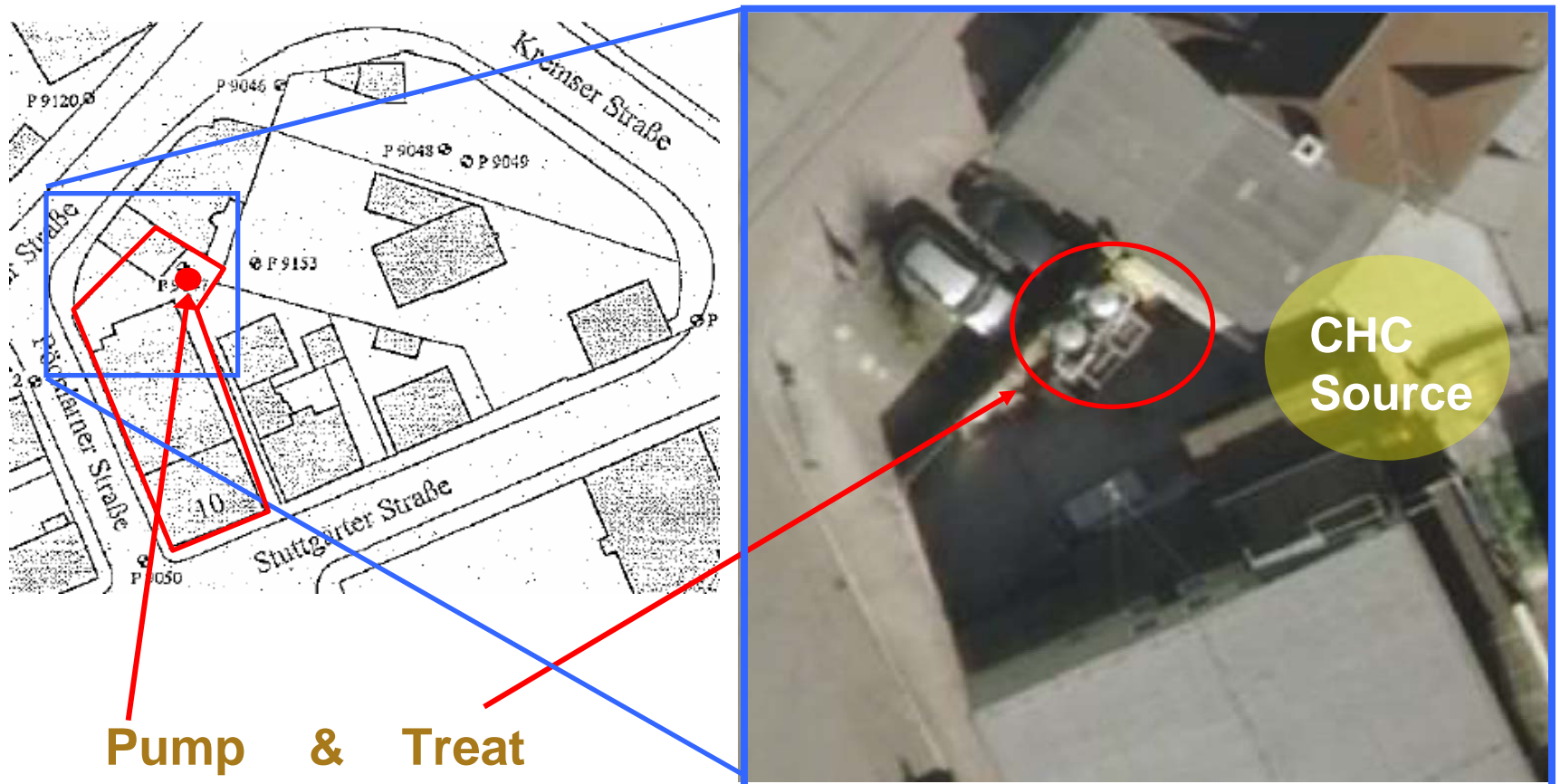
- Small site: 730m<sup>2</sup>
- Mixed used area
- Cohesive subsoil

- 1943 -1976: used by metall processing companies

# History of pilot site

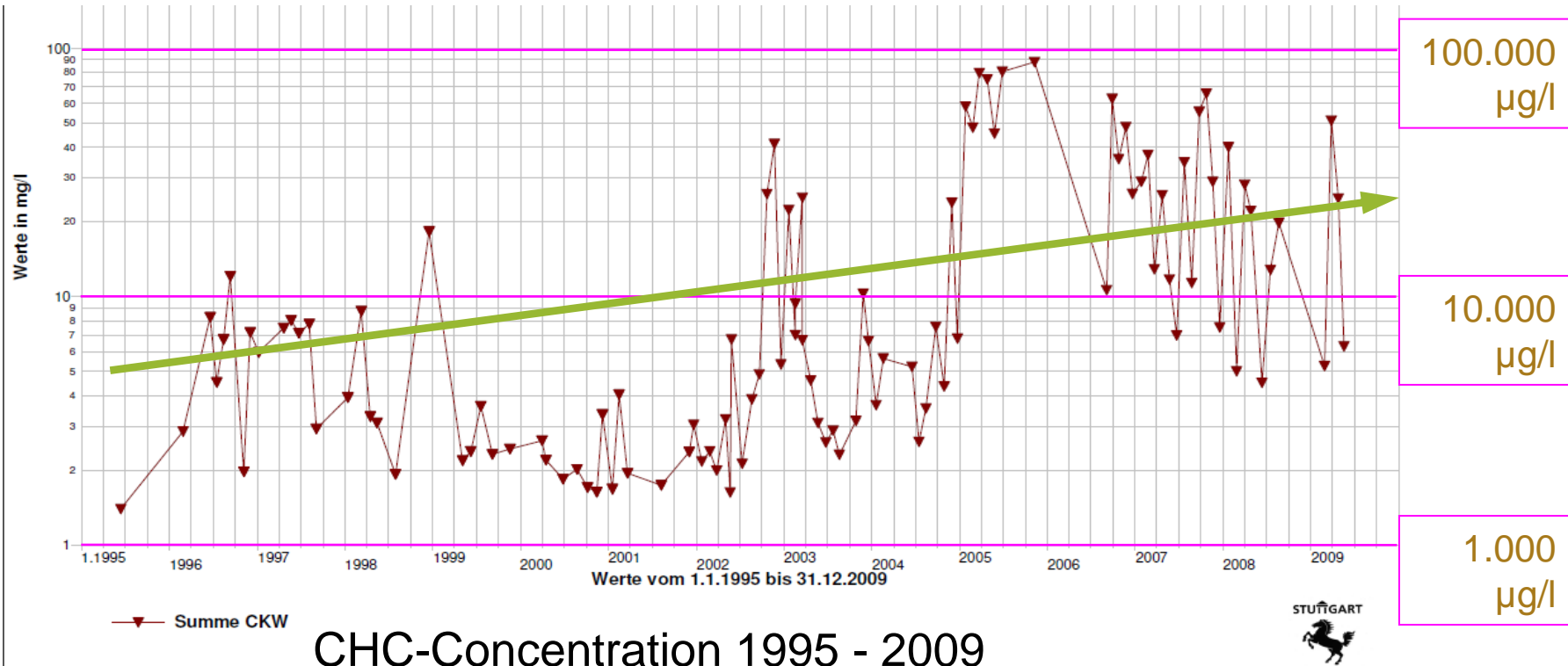
- 
- A large green arrow pointing downwards, indicating a chronological sequence of events.
- 1888: Building
  - 1943 -1976: metall processing companies
  - 1976 bis 11/2010: metall assembly company and carpet storage
  - 1991: Preliminary investigation: chlorinated hydrocarbons (CHC) dedected
  - 1993 -1996: soil vapor extraction (SVE): 310 kg CHC removed
  - since 1994: source remediation with pump & treat,  
1994 – 2010: 497 kg CHC removed
  - 2008 - 2009: detailed technical investigation, ideas competition on possible remediation techniques
  - August 2010: start of remedial planing

# Pump & Treat since 1994



**Pump & Treat**

# CHC-Concentration since 1995

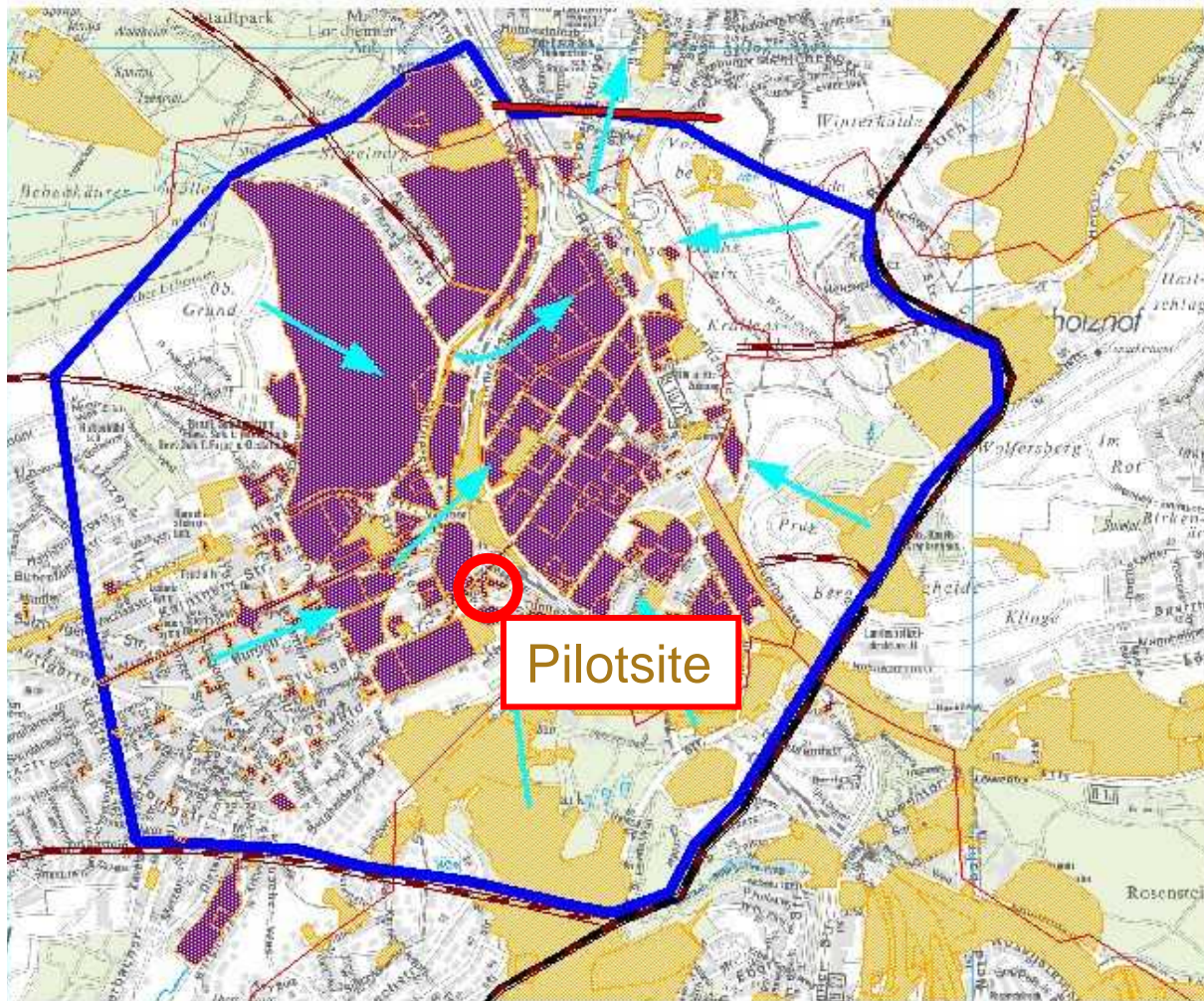


## Conclusion for the site

- Pump & treat would be necessary for a long time  
→ blocking site development
- Costs for 20 years: at least 600.000 €;  
→ Result??  
→ Maybe pump & treat is required for further decades!!

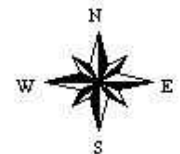
**→ Need for modification!**

# Field Conditions in Feuerbach 2004 : Many sites, but point sources of CHC

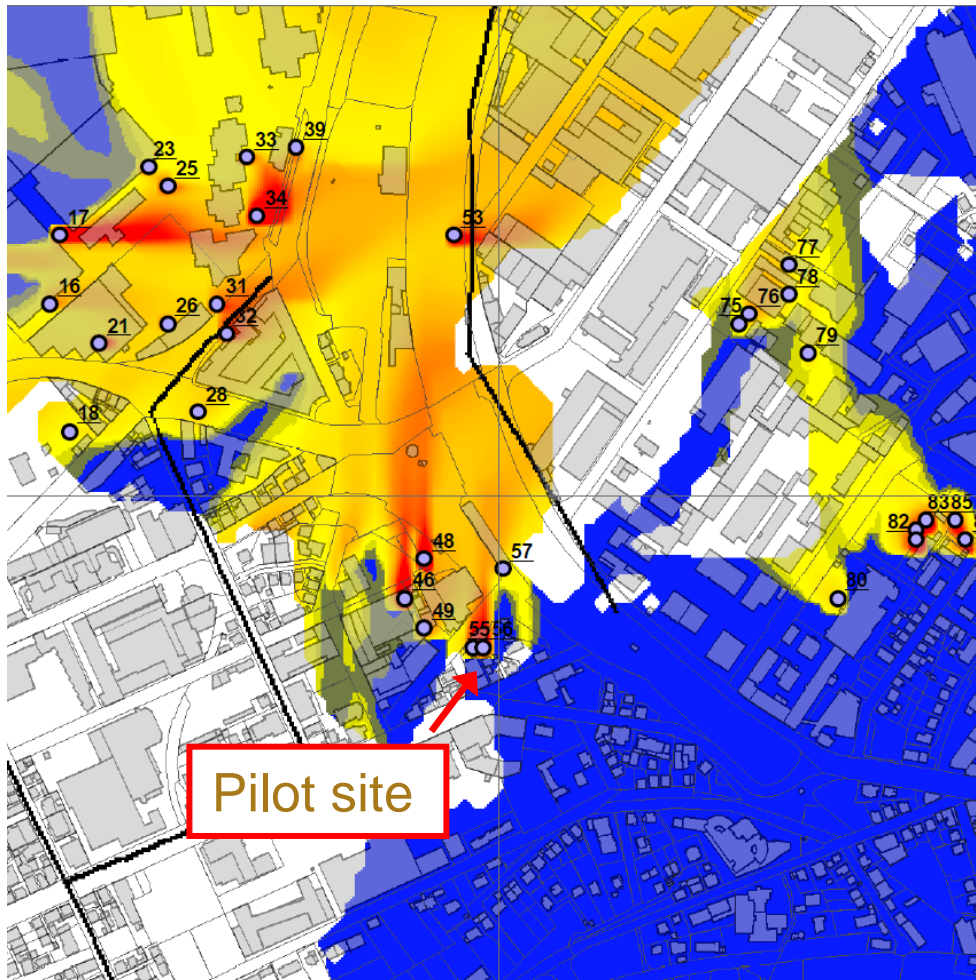


**MAGIC - project area  
"Feuerbacher Tal"**

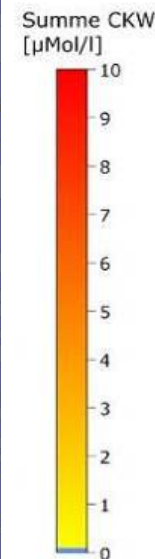
- project area
- urban districts of Stuttgart
- CHC sites 15/12/04
- potentially contaminated land
- groundwater flow direction
- control plane downstream project area
- watersheds
  - overground watershed
  - overground watersheds, subareas



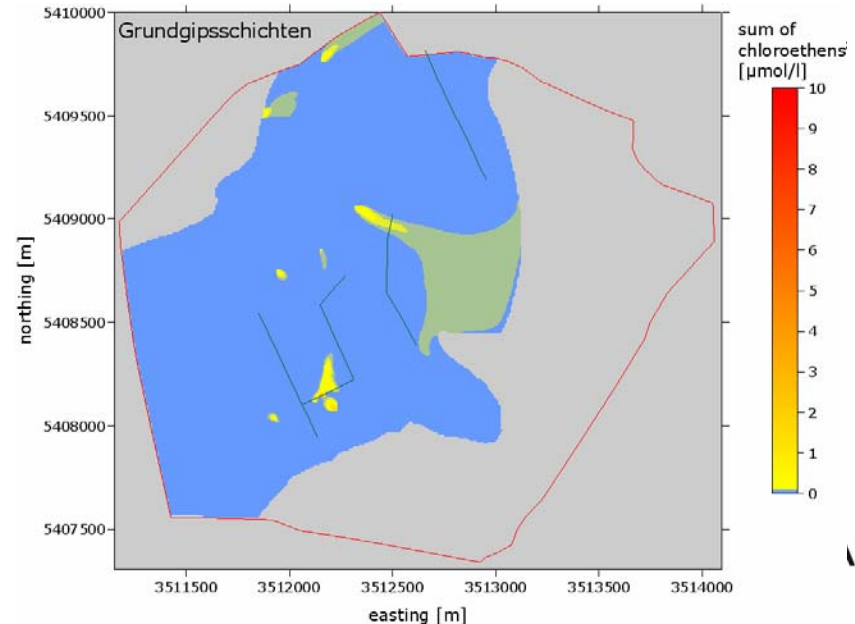
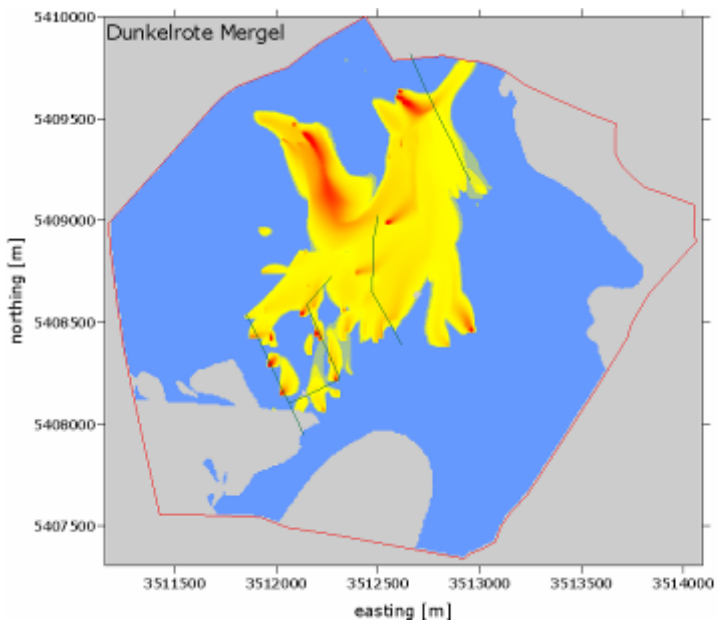
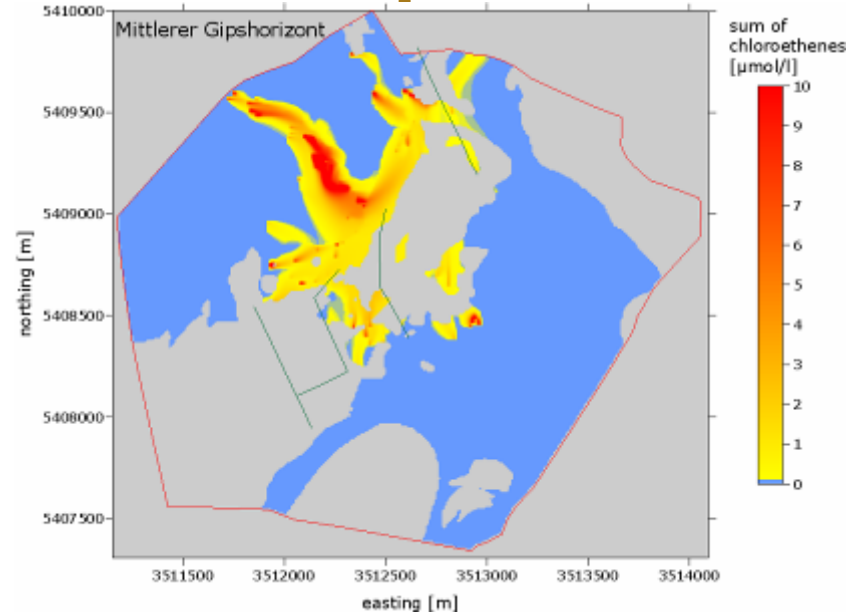
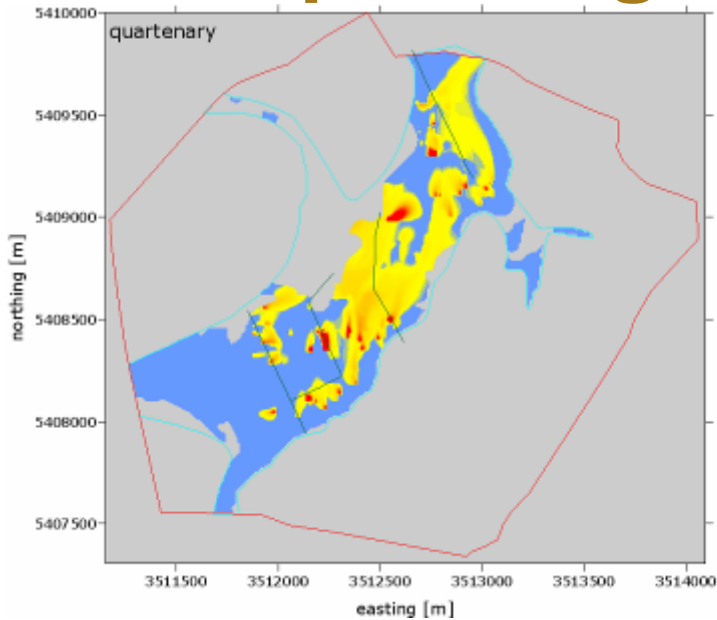
# Integral groundwater investigation



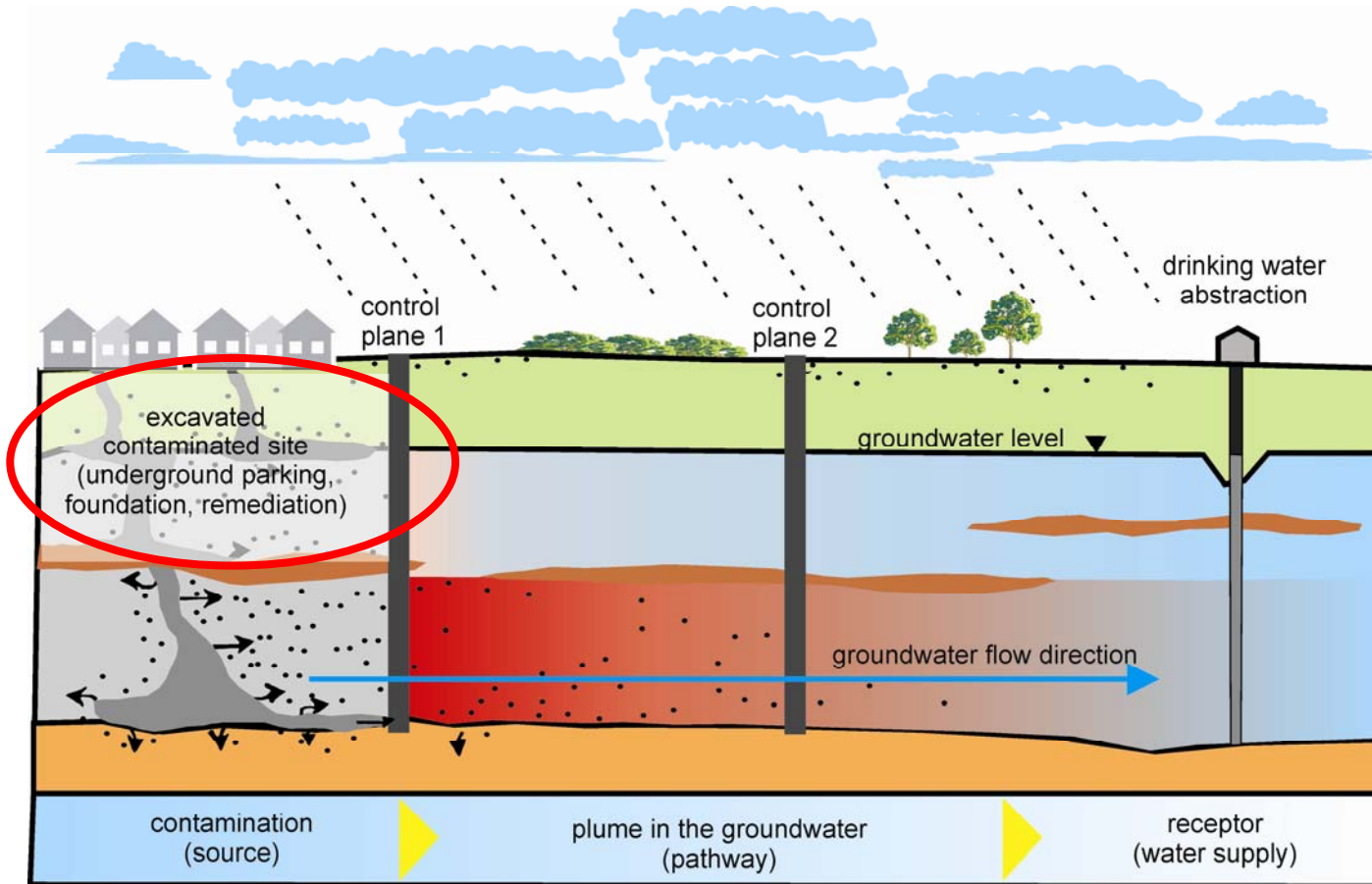
Results of integral groundwater investigation on CHC in Stuttgart-Feuerbach (EU-Project MAGIC 2005 -2008)



# CHC-spreading in different Aquifers



# Secondary sources (pools)



→ Not detectable with single site approach

# Single site approach for CHC contamination in cities?

1. Many small neighboured sources

2. No spatial overview of groundwater quality

3. Only a few polluters available

4. Measures related to single sources

5. Sources in different status of processing

6. Remediation long term and ineffectiv



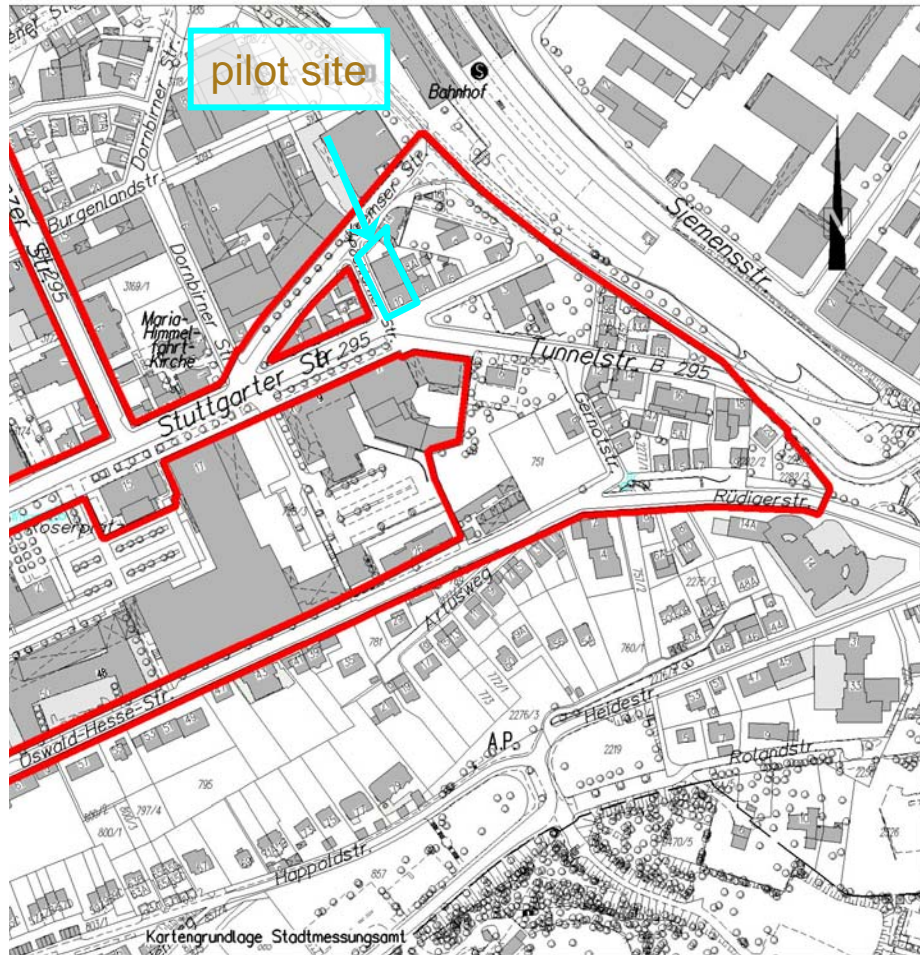
CHC  
Source

CityChlor



pilot site

# Urban redevelopment area



- urban redevelopment 2000 – 2010
- Stimulation of renovation of private and public buildings
- Renovation of sidewalk and new promenade
- No development on the site due to contamination

# For sale?



- Site is in municipal ownership since 1991
- Should be for sale since 2008

but

- Plans where stopped due to contamination
- Remediation first

# Chicken or the egg?

- Does urban redevelopment stimulate remediation?
- Can remediation stimulate urban development?

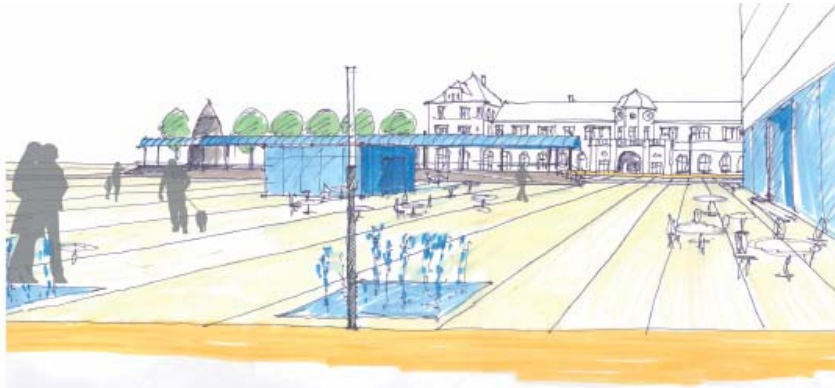
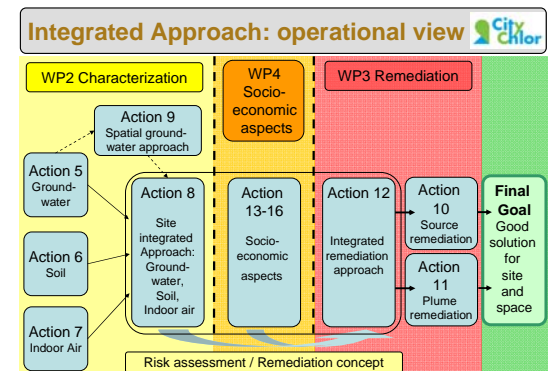
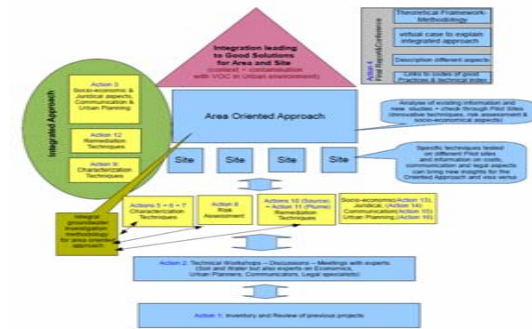


Abbildung 22: Perspektive Bahnhofsvorplatz Stuttgart-Feuerbach (Quelle: faktorgruen - Landschaftsarchitekten)

# And the answer?

We try to find the solution with the integrated CityChlor approach, to solve the problems at Stuttgart pilot site and similar problems at other sites with CHC in Europe.



# 9 Partners, 4 Work packages,

# 1 Project

**ADEME**

WP1 Review and Integration

**Utrecht**

**OVAM**

WP2 Characterization

**Stuttgart**

**Bodem+**

**ITVA**

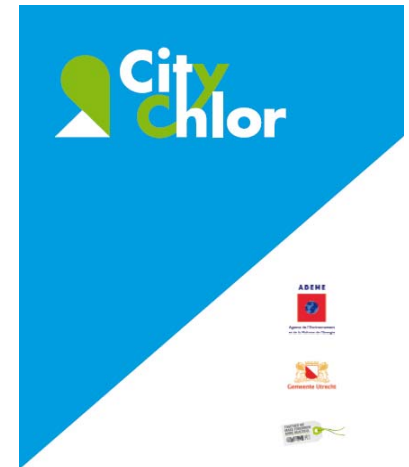
WP3 Remediation

**Mortsel**

**Ghent**

**INERIS**

WP4 Socio-economic aspects



**9 Partners, 4 Work packages, 1 Project**

**...will develop**

**the**

**Integrated CityChlor Approach**

