

ahu AG Wasser · Boden · Geomatik, Aachen
(Tina Neef, Axel Meßling, Ulrich Lieser)

Symposium Expertisecentrum PFOS / PFAS

16.02.2016

1
16.02.2015 Witteveen + Bos / ahu AG





Table of content

1. Some aspects of the situation in Germany
2. Examples
 - Fire fighting station (long term usage of PFC)
 - Fire Fighting operation (one singular accident)
3. Conclusions

2
16.02.2015 Witteveen + Bos / ahu AG


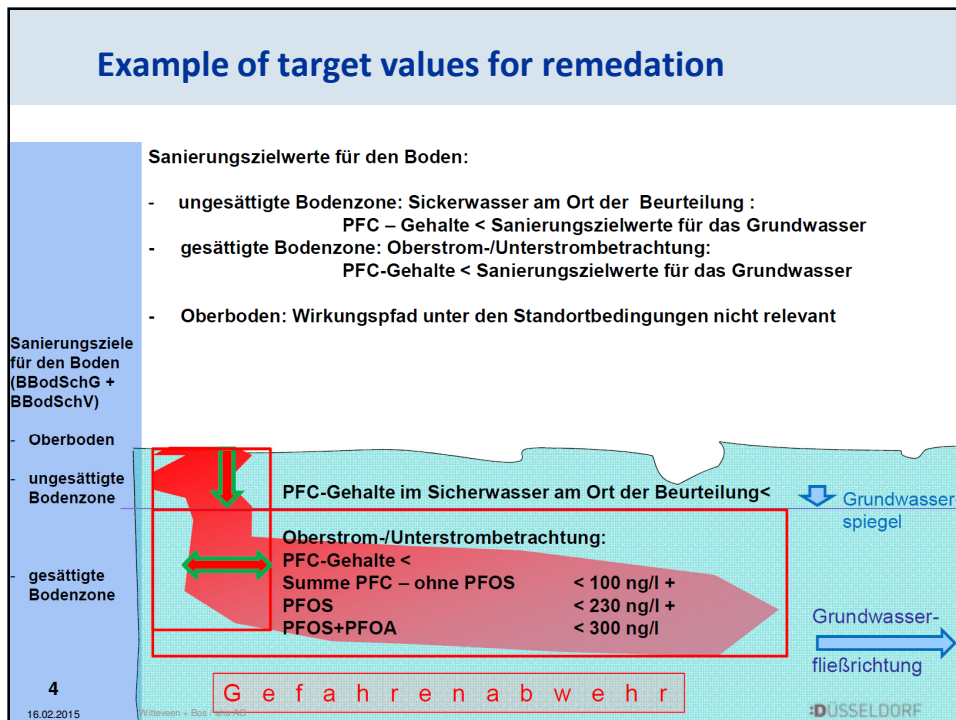


Guide values /critical values


drinking water	Generell value of prevention ¹ (apply to the sum PFOA+PFOS and potential more PFT)	100 ng/l
	LWTW ² sum of PFOS and PFOA	300 ng/l
	LWTW sum of PFBA	700 ng/l
	Value of orientation for the sum of all per- und polyfluorinated compounds	1.000 ng/l
surface water	UQN-value PFOS (valid from 22. Dezember 2018)	0,65 ng/l
groundwater	Suggestion of the minor threshold value of LAWA for PFOS	230 ng/l
waste water (direct- and indirect discharger)	Value of orientation for PFOA und PFOS ³	300 ng/l
	Value of orientation for sum of measured PFC ³	1.000 ng/l
discharge of cleaned groundwater into surface water	Individual decision of civil service depending on the water body on the basis of the deterioration prohibition according to § 30 WHG and the UQN for PFOS	
food	tolerable daily intake (TDI)	0,15 µg/kg KG ⁵ /d PFOS 1,5 µg/kg KG/d PFOA

¹ statement of committee for drinking water of UBA
² LWTW: guide value of committee for drinking water
³ Runderlass des Ministeriums für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen vom 12.12.2012, Az.: IV-7 096 004 0052
⁵ KG: body weight


3
16.02.2015 Witteveen + Bos / ahu AG





Existing Guidelines in Germany



**Bundesamt für Infrastruktur,
 Umweltschutz und Dienstleistungen
 der Bundeswehr**

LEITFADEN
**Bearbeitung von Verdachtsbereichen mit
 per- und polyfluorierten Chemikalien (PFC)**
 auf von der Bundeswehr genutzten Liegenschaften




Bundeswehr
 Wir. Diener. Deutschland.

Länderfinanzierungsprogramm „Wasser, Boden und Abfall“




Boden- und Grundwasserkontaminationen mit PFC
 bei altlastverdächtigen Flächen und nach Löschmitteleinsätzen

Arbeitshilfe zur flächendeckenden Erfassung, standortbezogenen historischen
 Erkundung und zur Orientierenden Untersuchung (Projektstufe 1)

(Projekt-Nr. B 4.14)


5
 16.02.2015 Witteveen + Bos / ahu AG

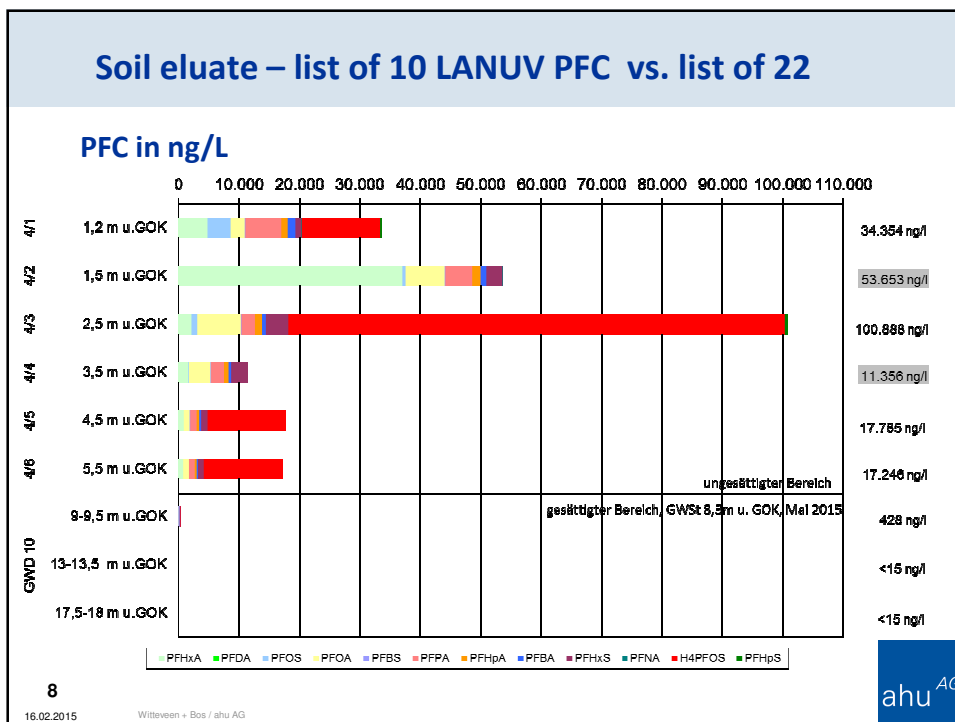
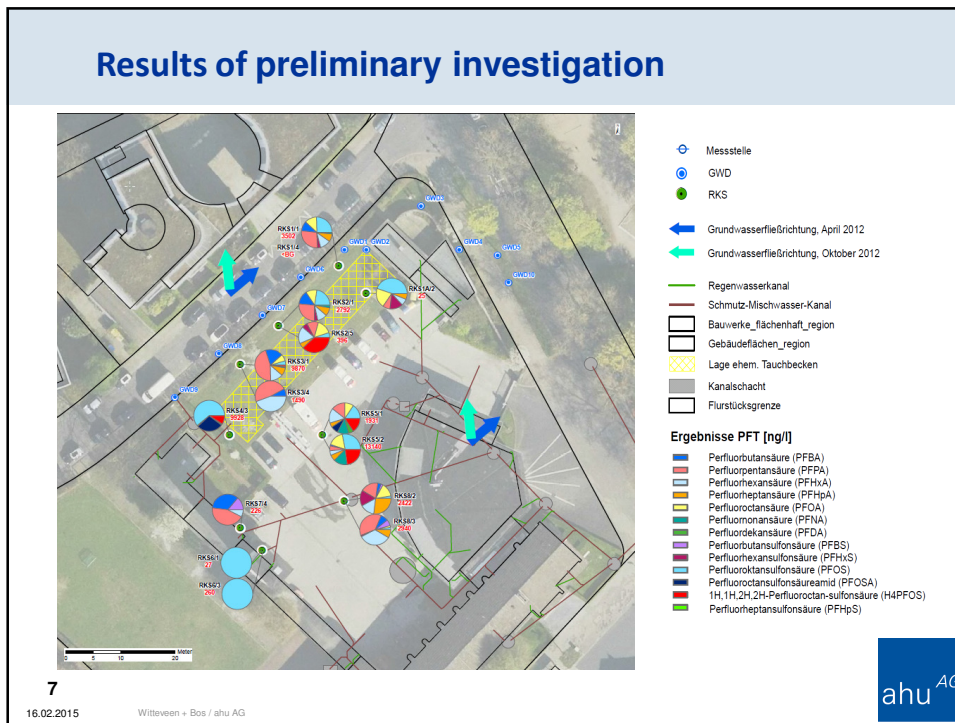


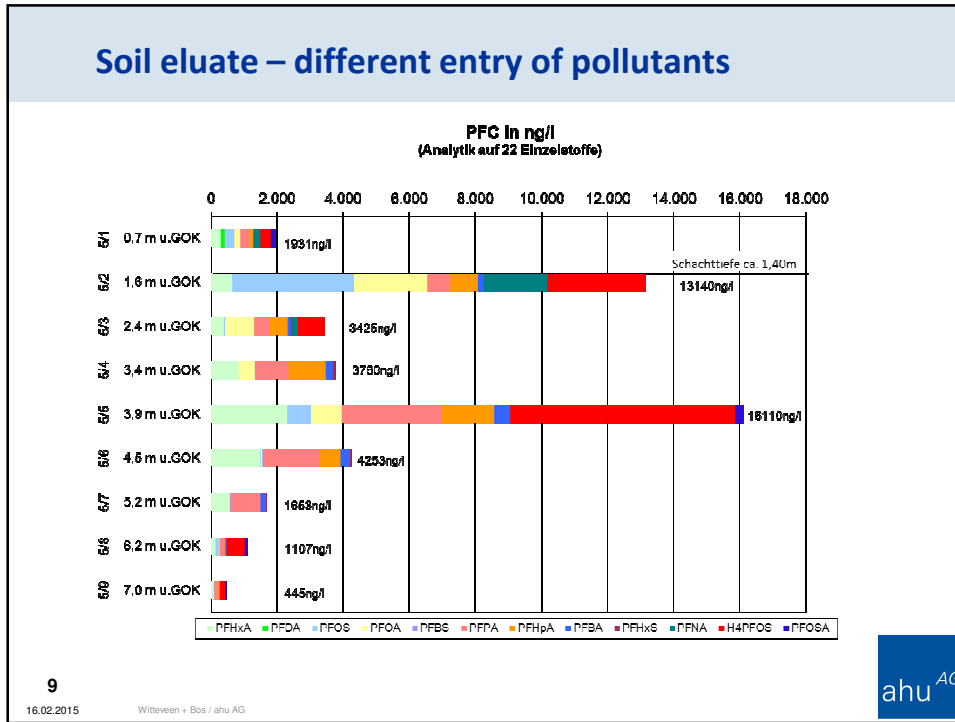
Projekt example: fire station

Project title	Soil and groundwater investigations
Description	Investigations on PFC contaminations around fire stations : investigation and consultation
Dates	since 2013
Specials	Supplementary aspects (telomeres), diffuse dissemination

6
 16.02.2015 Witteveen + Bos / ahu AG



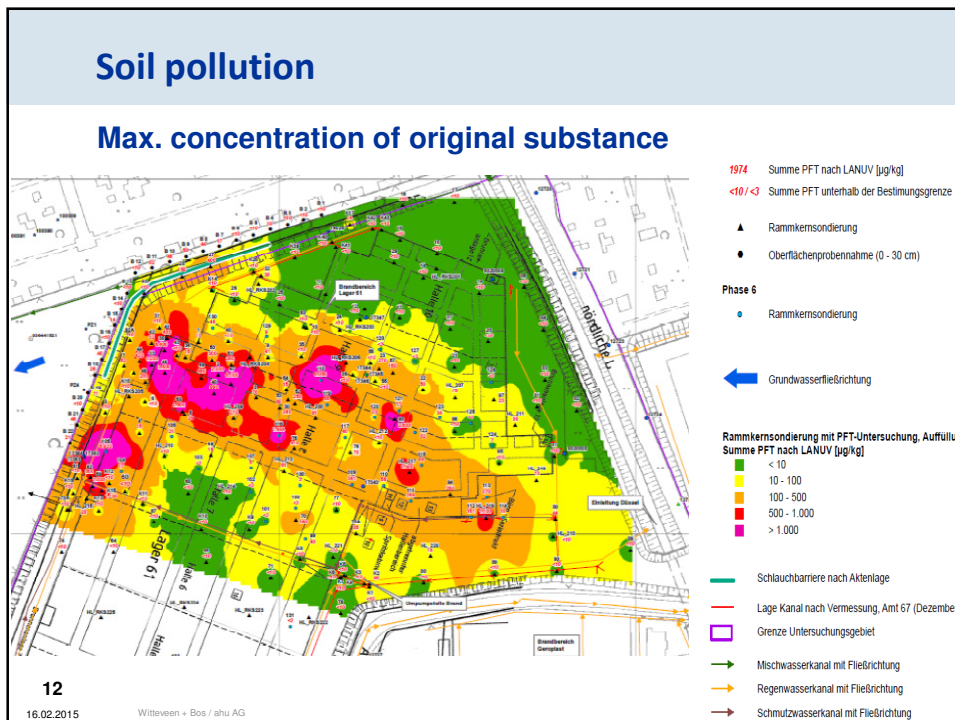
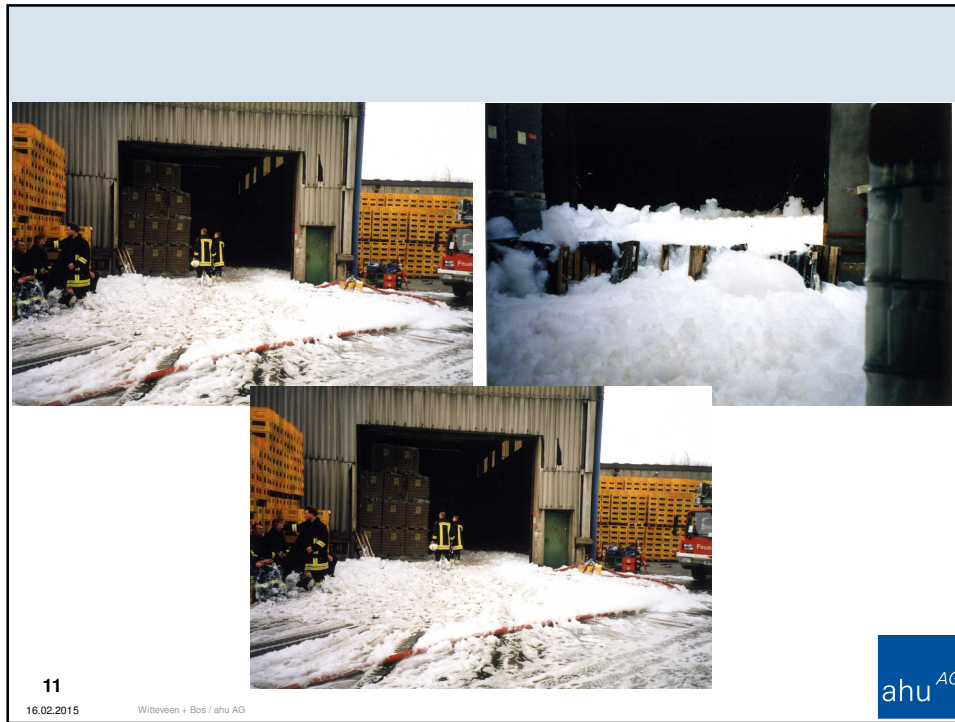


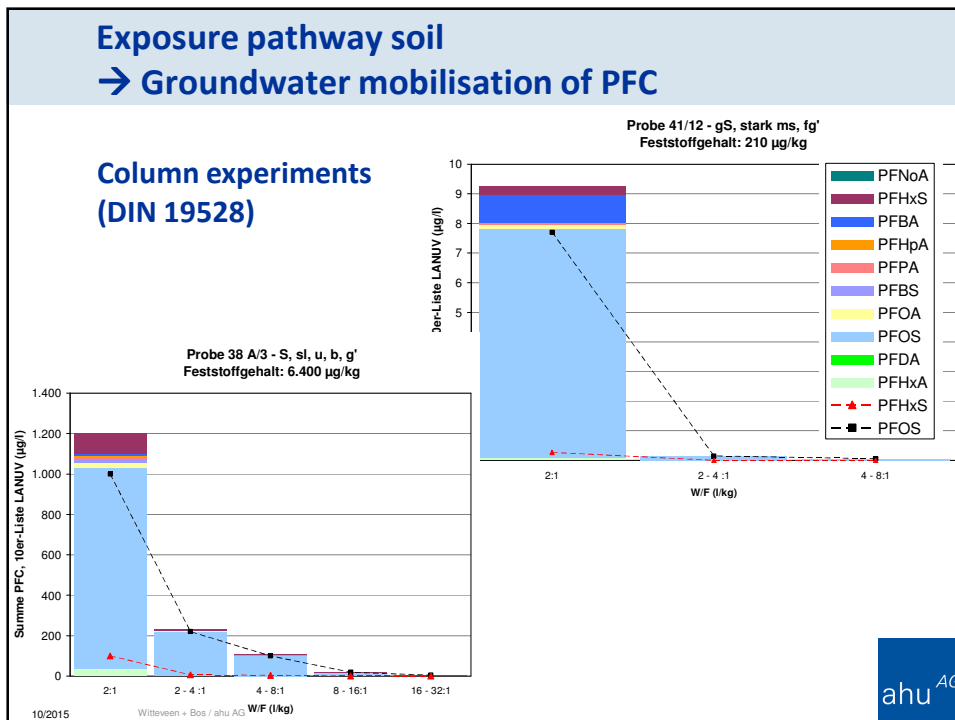
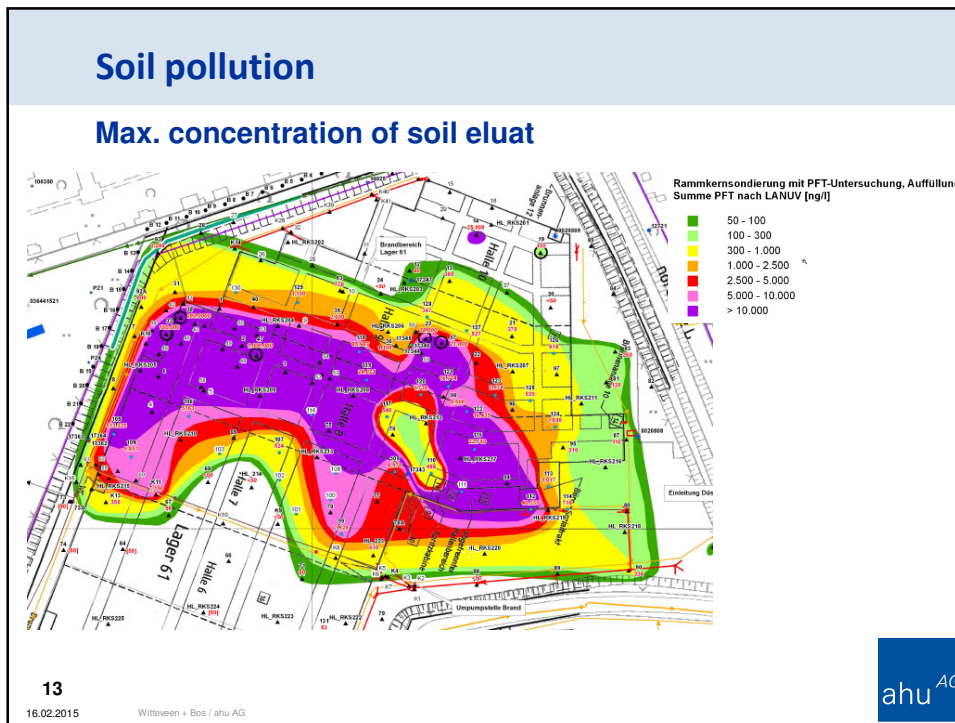


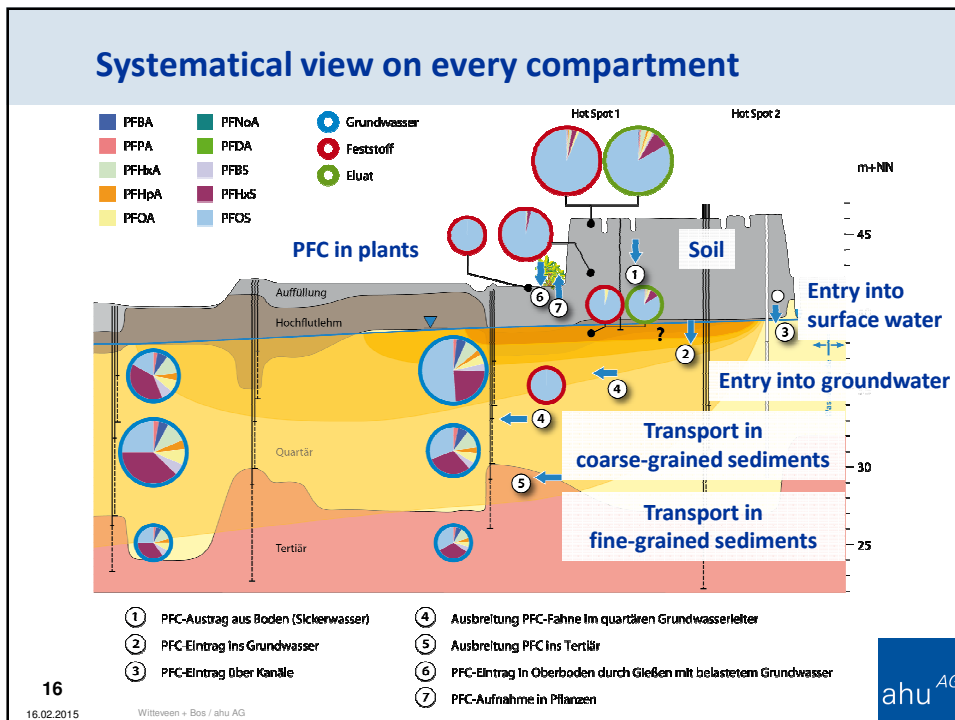
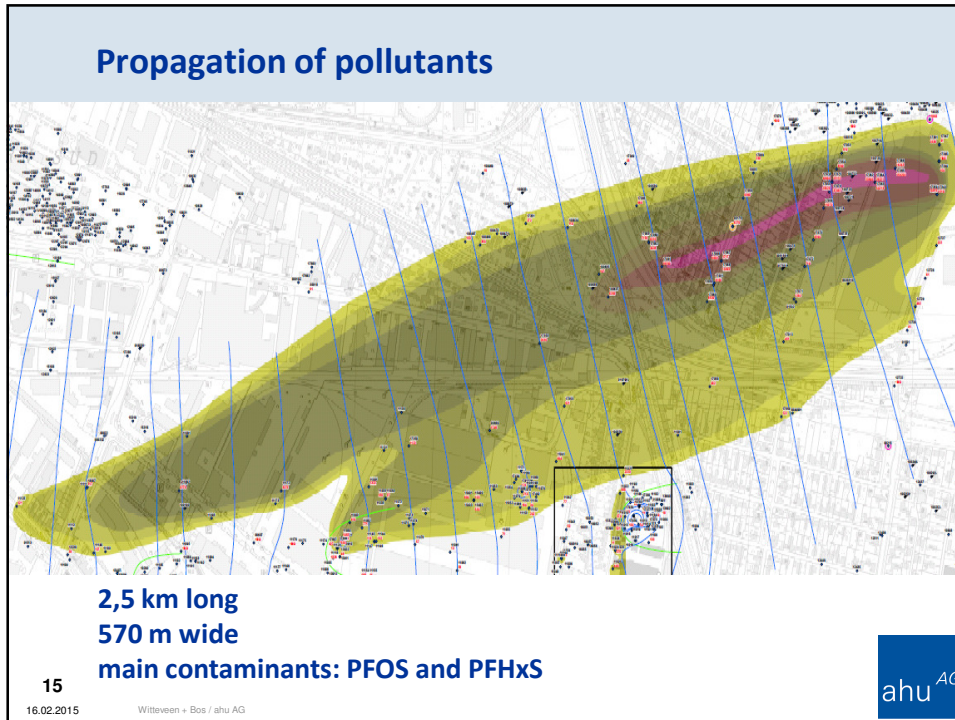
Projekt example: fire fighting operation

Project title	Soil and groundwater investigations
Description	Investigations on PFC contaminations as a result of a fire fighting operation
Dates	since 2008
Specials	Heterogeneous dissemination, differential dilution, in the beginning analytical aspects

10
16.02.2015 Witteveen + Bos / ahu AG







Sampling via method of groundwater-direct

Overview of the system

The diagram illustrates the components of a groundwater sampling system. It shows two main types of sondierstange (sampling rods): a 1220mm CH-Sondierstange and a 1000mm CH-Sondierstange. The 1220mm rod is equipped with a 'reitender Schlagkopf mit Kabelnut' (sliding hammer head with cable groove) and a 'Gewindeadapter' (thread adapter). The 1000mm rod features a 'PE Filter' (polyethylene filter) and an 'Aufnahmerohr' (collection tube). Other components include 'variorene Spitze' (variable tip), 'feste Rammspitze' (fixed rammer tip), 'injektions-spitze' (injection tip), 'Verteilungs-ring' (distribution ring), 'variorene Spitze' (variable tip), 'Stopfen' (stopper), and 'Aufnahmeadapter' (collection adapter). A 'Führungsring' (guide ring) is also shown. The Carl Hamm logo is present in the bottom right of the diagram area.

17
16.02.2015
Witteveen + Bos / ahu AG

ahu^{AG}

Conclusions (1)

- PFC are already hazardous for groundwater if the detection limit is reached for analysing original soil substance
- One single accident can cause a very large groundwater contamination with very fast expansion rates
- Systematic and stepwise estimation of „every“ pathway is absolutely necessary
- Lack of knowledge concerning assesment criteria, remediation possibilities and the range of parameters that have to be examined
- Challenging work of investigation and remediation because of fast developing and complex methods of investigation

18
16.02.2015
Witteveen + Bos / ahu AG

ahu^{AG}

Conclusions (2)

- Localisation of the source of contamination not only with analysis of the original substance but also with eluates
- Sorption of the PFC to fine-grained, humic-rich sediments is presumably
- Groundwater treatment concerning PFC is significantly extensive than treatment of standard contaminations (LHKW, BTEX)
- Substitute materials for PFC often bear the same or even new problems

19

16.02.2015

Witteveen + Bos / ahu AG

ahu^{AG}

ahu^{AG}

Thank you for your attention!

Do you have any questions?

Tina Neef, t.neef@ahu.de
Axel Meßling, a.messling@ahu.de
Dr. Georg Meiners, g.meiners@ahu.de

www.ahu.de

20
16.02.2015
Witteveen + Bos / ahu AG