



Chemical Monitoring On Site (CM Onsite)  
organised by NORMAN Association  
and JRC in support of CIS WFD

NORMAN Interlaboratory study (ILS) on  
passive sampling of emerging pollutants

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**Water Research Institute, Slovakia**

# Interlaboratory study, **Steering group**

VUVH, Slovakia (coordinator)
Cemagref Bordeaux, France
ISM-LPTC, University of Bordeaux, France
Cemagref Lyon, France
DG JRC IES
UK Environment Agency
DELTARES
RECETOX, Masaryk University, Czech rep.
Institute of Public Health Ostrava, Czech Republic
QUASIMEME

# Design interlaboratory study

## Exposure at a single site

- 1 different samplers from participating labs
- 2a analytical comparability
- 2b same sampler type for all by organiser
- 3 comparison with spot sampling

# Target compounds

## ***Pesticides :***

Terbutylazine  
Desethylatrazine  
Desethylterbutylazine  
Atrazine  
Carbendazim  
S-metolachlor  
Diuron

## ***Pharmaceuticals:***

Carbamazepine  
Diclofenac  
Ibuprofen  
Naproxen  
Diazepam  
Alprazolam  
Ketoprofen  
Atenolol

## ***Steroid hormones:***

17-alpha-Estradiol  
17-alpha-Ethinylestradiol  
17-beta-Estradiol  
Estriol  
Estrone

## ***Bisphenol A Triclosan***

## ***Fluorinated surfactants*** PFOA, PFOS

## ***Brominated flame retardants*** BDE 28, 47, 99, 100, 153 and 154

# Contribution and tasks

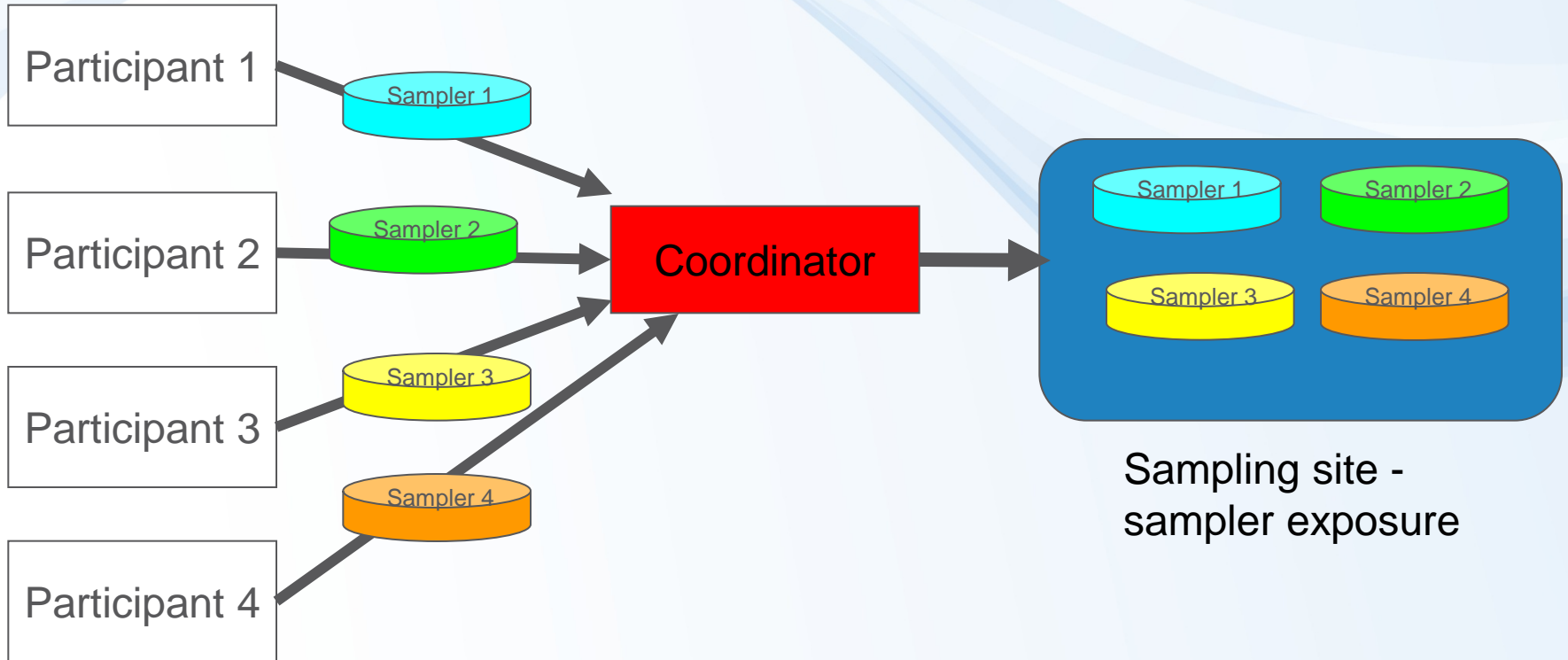
Organisation	Role
WRI, Slovakia	Coordinator
Cemagref Bordeaux, France	Preparation of analytical QC standards,  Analysis of samplers that are provided to participants,  Analysis of parallel water samples (not BDEs)
ISM-LPTC, University of Bordeaux,	
Cemagref Lyon, France	
UK Environment Agency, UK	
DG JRC IES	
RECETOX + DELTARES	
Institute of Public Health Ostrava, Czech Republic	Sampling support
RECETOX	Sampling support Data interpretation
QUASIMEME	Data handling

# Interlaboratory calibration study in 2011

- Target substances:
  - **Polar pesticides** – 19 participants
  - **Pharmaceuticals** – 17 participants
  - **Steroid hormones** – 15 participants
  - **Triclosan** – 8 participants
  - **Bisphenol A** – 11 participants
  - **PFOA, PFOS** – 8 participants
  - **PBDE** – 16 participants
- 30 participants from commercial, academic and regulatory laboratories
- Request to report other compounds detected

# 1. Exposure of passive samplers from participants

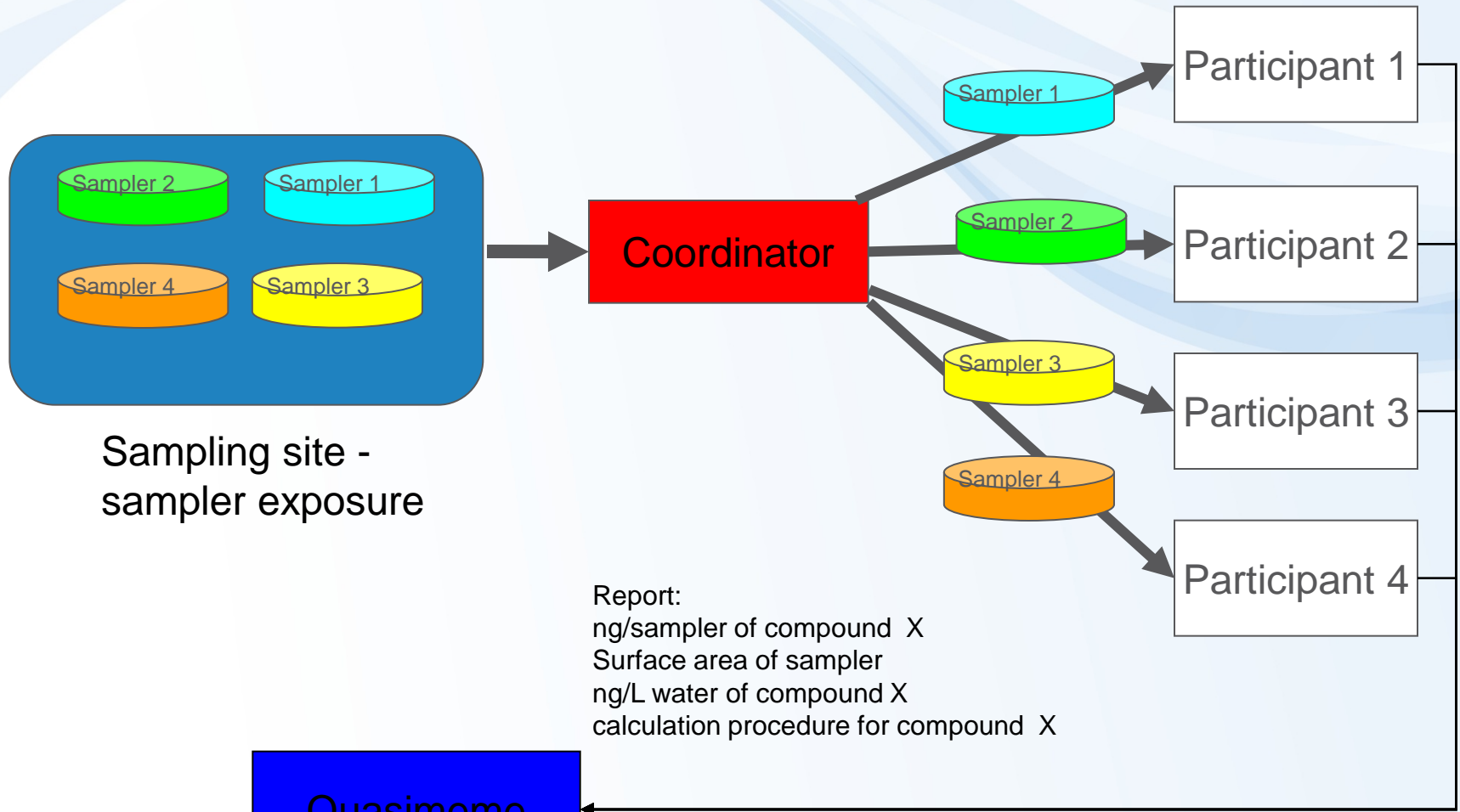
for selected analyte/analytes



Report:  
ng/sampler of compound X  
Surface area of sampler  
ng/L water of compound X  
calculation procedure for compound X

# 1. Recovery passive samplers from participants

for selected analyte/analytes



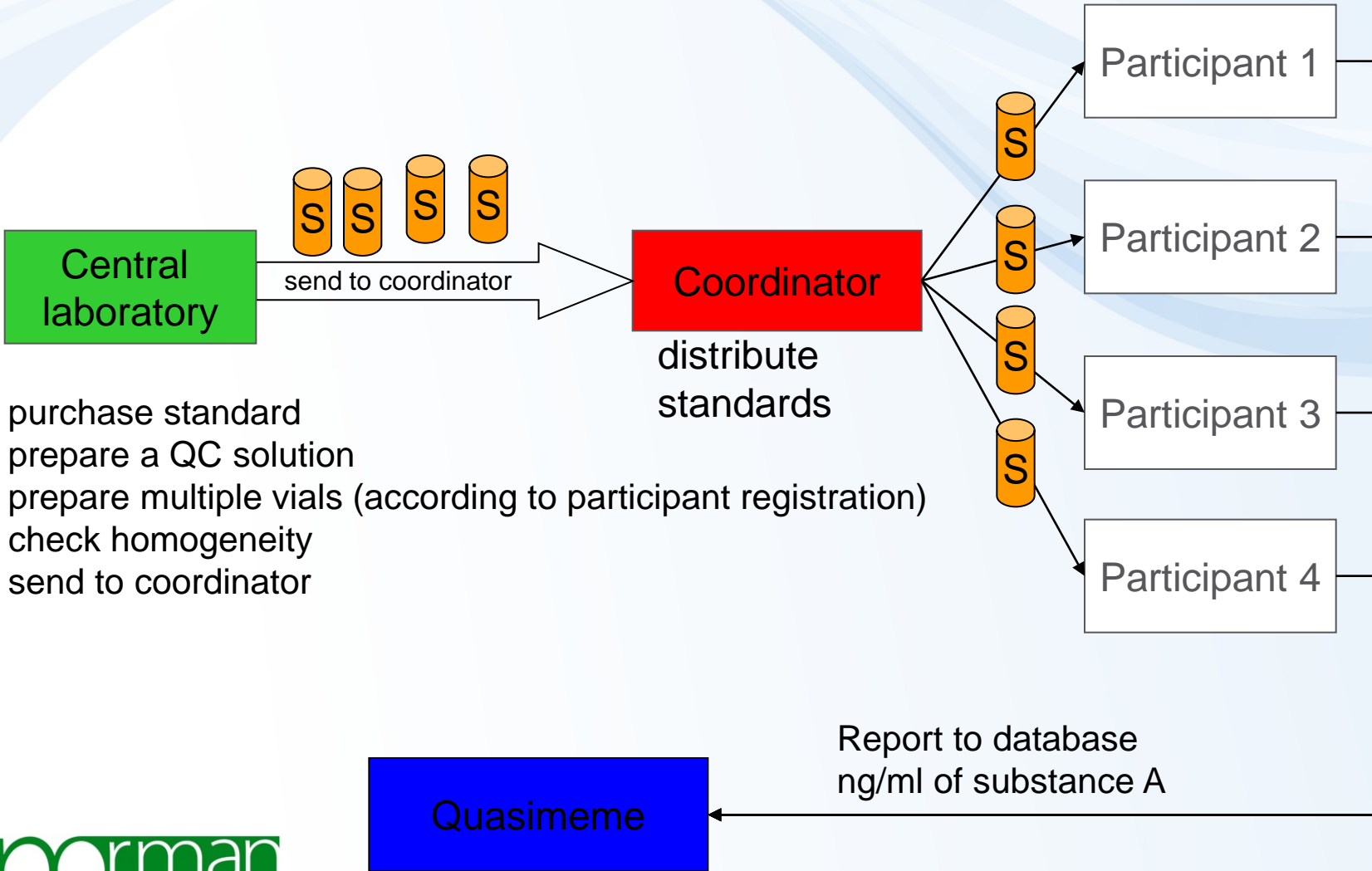




Standard solution

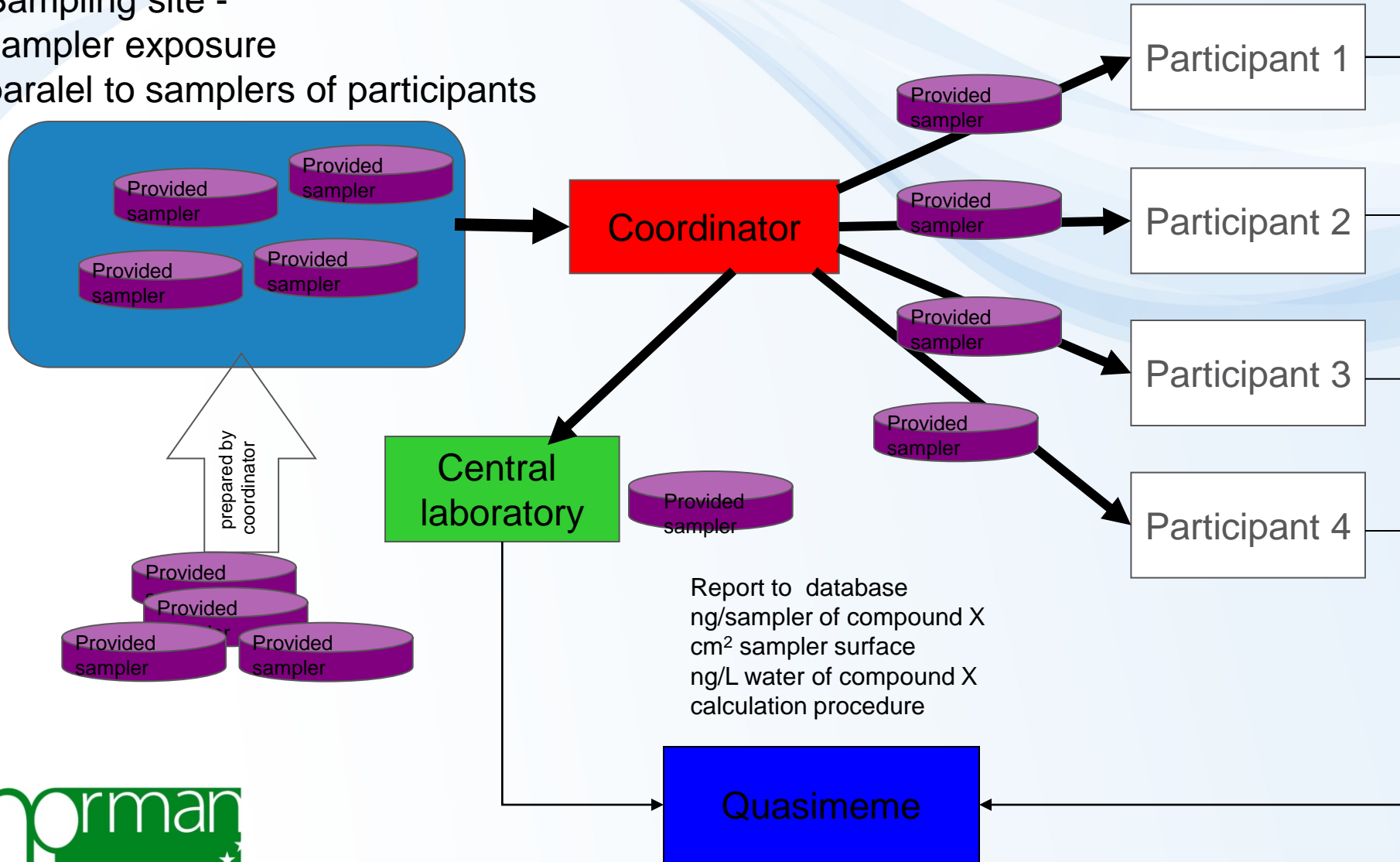
## 2a. Standard solution

for selected analyte/analytes



## 2b. Provided passive samplers

Sampling site -  
sampler exposure  
parallel to samplers of participants

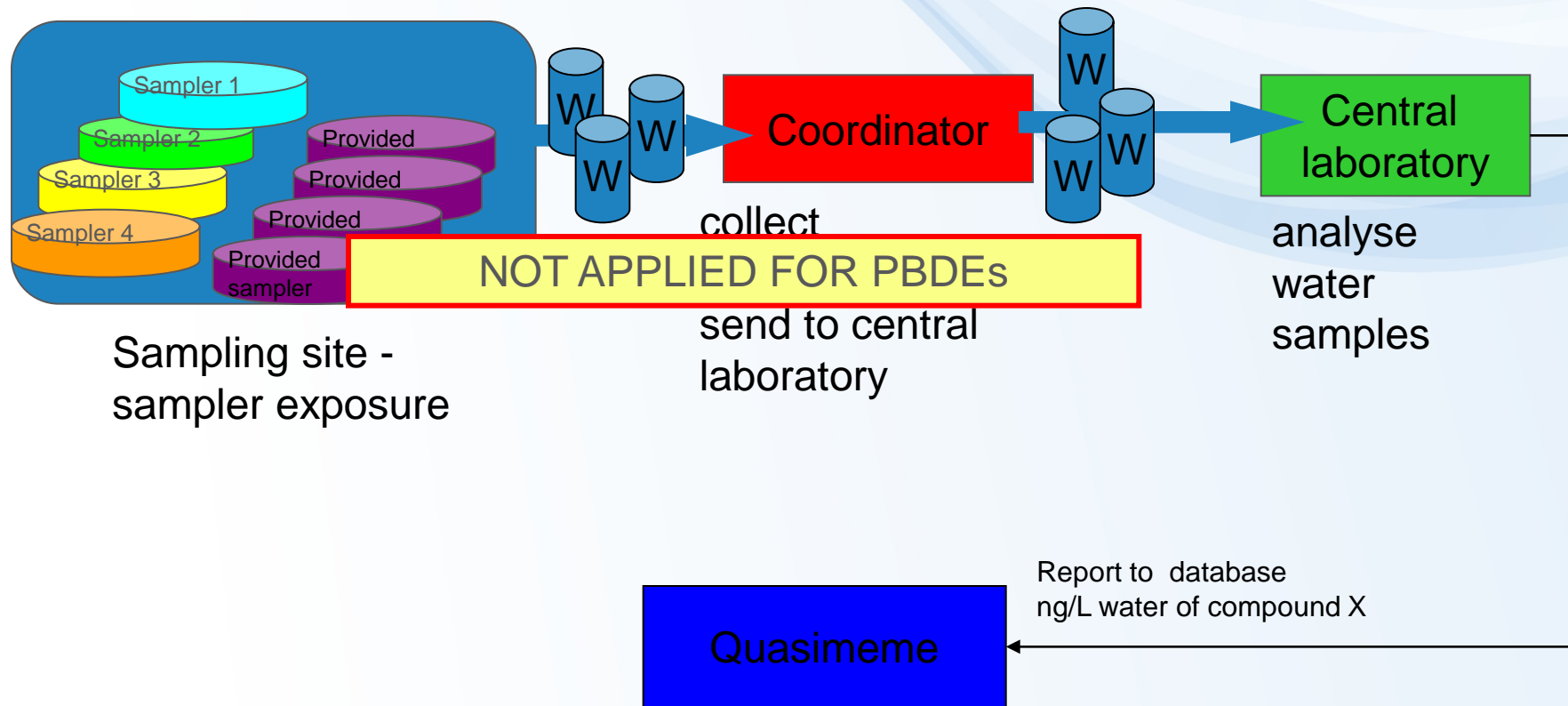


### 3. Water; continuous sampling



water sample

for selected analyte/analytes



Sampling site -  
sampler exposure

collect

NOT APPLIED FOR PBDEs

send to central  
laboratory

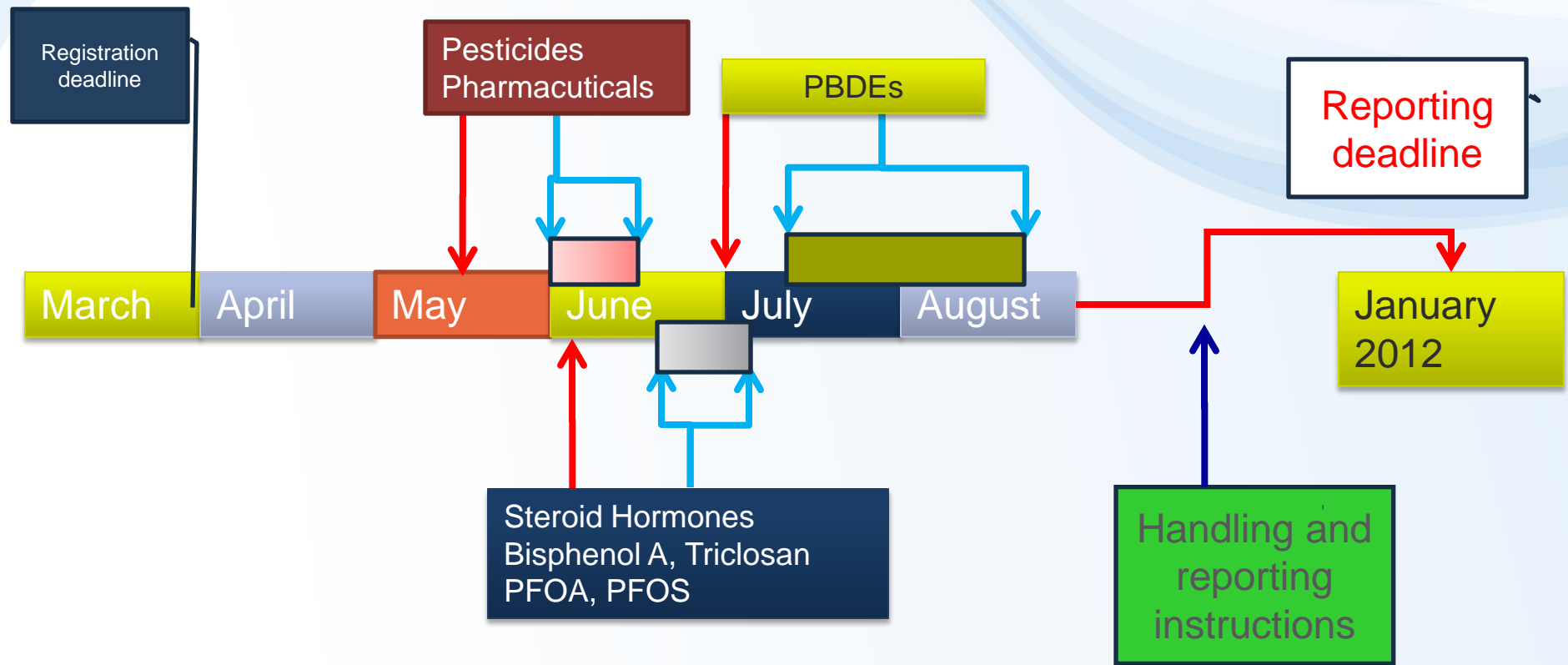
Central  
laboratory

analyse  
water  
samples

Quasimeme

Report to database  
ng/L water of compound X

# Campaign timeline



## Continuous water sampling



# WATER SAMPLING PROTOCOL

## pesticides + pharmaceuticals

### FIELD SAMPLES

Automatic sampler (on site):

Collect 100 mL/h x 24h = 2400 ml/day

Transport to  
RECETOX:

Transfer 24h composite water sample every day from 12x1 L autosampler cylinders to a clean 2.5 L amber glass bottle, homogenise and transport on ice to the laboratory

### BLANK SAMPLES

500 mL Milliq water/day

Filter through Whatman GF/F

250  
ml/day

**bottle E**

2L; Nalgene

Store @ -20°C

1750 ml / 7-day  
composite **BLANK**  
Send weekly to  
ISM-LPTC  
Bordeaux

140  
ml/day

**bottle F**

1L; glass bottle

Store @ 4°C

980 ml / 7-day  
composite **BLANK**  
Send weekly to  
Cemagref  
Bordeaux

1000 mL/day

Filter through Whatman GF/F

500 mL/day

Pharmaceuticals

250 ml/day

**bottle A**

2L; Nalgene

Store @ -20°C

1750 ml / 7-day  
composite sample  
Send weekly to ISM-  
LPTC Bordeaux

250 ml/day

**bottle B**

2L; Nalgene

Store @ -20°C

1750 ml / 7-day  
composite **BACKUP**,  
store at RECETOX

300 mL/day

Pesticides

140  
ml/day

**bottle C**

1L; glass bottle

Store @ 4°C

980 ml / 7-day  
composite sample  
Send weekly to  
Cemagref Bordeaux

140  
ml/day

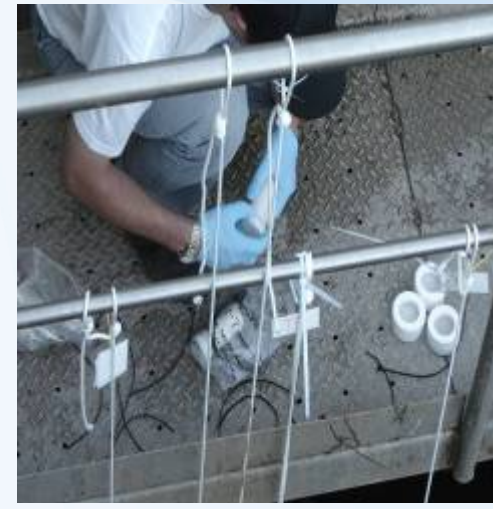
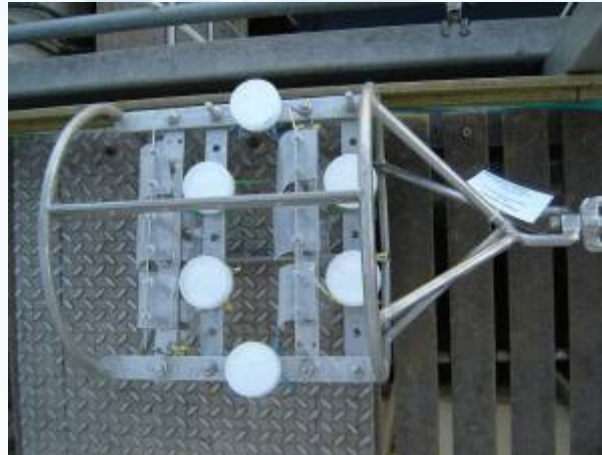
**bottle D**

1L; glass bottle

Store @ 4°C

980 ml / 7-day  
composite **BACKUP**  
store at RECETOX

# Sampler preparation for deployment



# Sampler deployment





## Sampler deployment



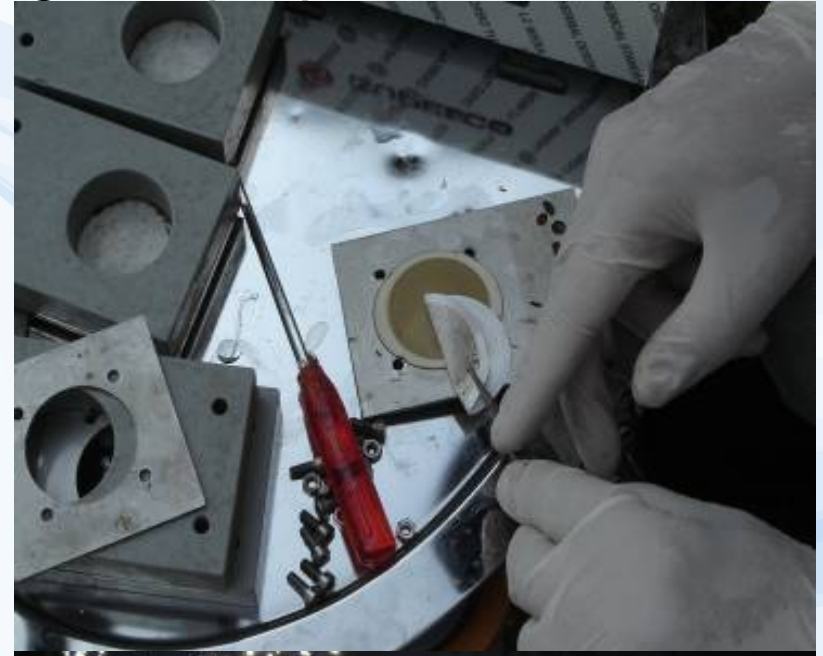
# Sampler recovery



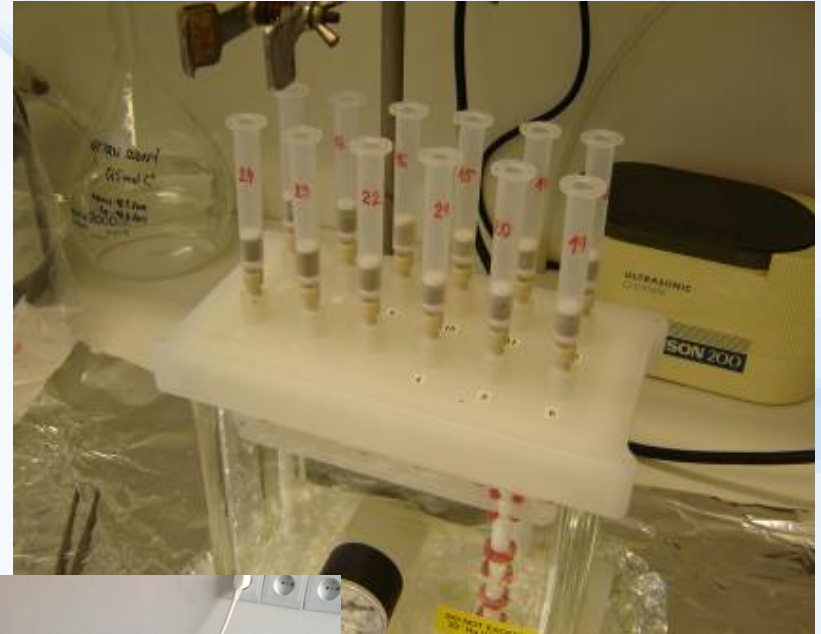
# Sampler recovery



# Onsite sampler cleaning and preparation



# Laboratory preparation of provided samplers



# Study results

## Statistics:

30 participating laboratories from Europe, North America and Australia

292 reference samplers for polar compounds distributed

80 reference samplers for PBDE

268 participant samplers for pesticides and pharmaceuticals

285 participant samplers for PFOS, steroids, bisphenol A and triclosan

132 participant samplers for PBDE

Total: cca. **1057 samplers were deployed at the reference site and distributed for analysis**

The reporting deadline for laboratories has been set to 15<sup>th</sup> January 2012

A dissemination workshop will be organised  
jointly by NORMAN + DG JRC