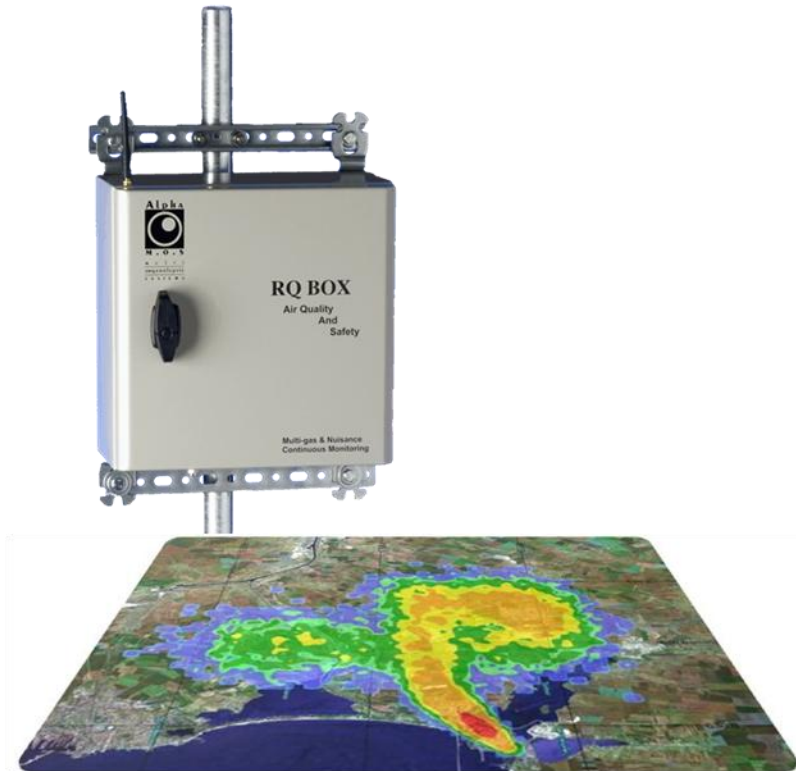


ODOUR MONITORING :

Measure at source and dispersion forecast.
What are the feedback on the use of
electronic noses ?





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Identifying odour sources

Olfactometric measurement
eNose measurement

Daily monitoring

eNose working principle

Exploitation of results

Improving communication
Optimization of treatment solution

Feedback on eNose

Suez Sita Donzère (M. Hassad)





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eNose

- ▶ Founded in 1993 by Jean-Christophe Mifsud
- ▶ 1st company to introduce e-noses to the market
- ▶ A world leader in the manufacture of human sense digitization systems
 - Smell, taste, sight   
- ▶ Leading provider of multi organoleptic systems
 - Over 1400 instruments sold worldwide
 - Deployed in over 20 countries
 - Strongly committed to research and innovation





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WORLDWIDE NETWORK OF DISTRIBUTORS



Identifying odour sources

Olfactometric measurement

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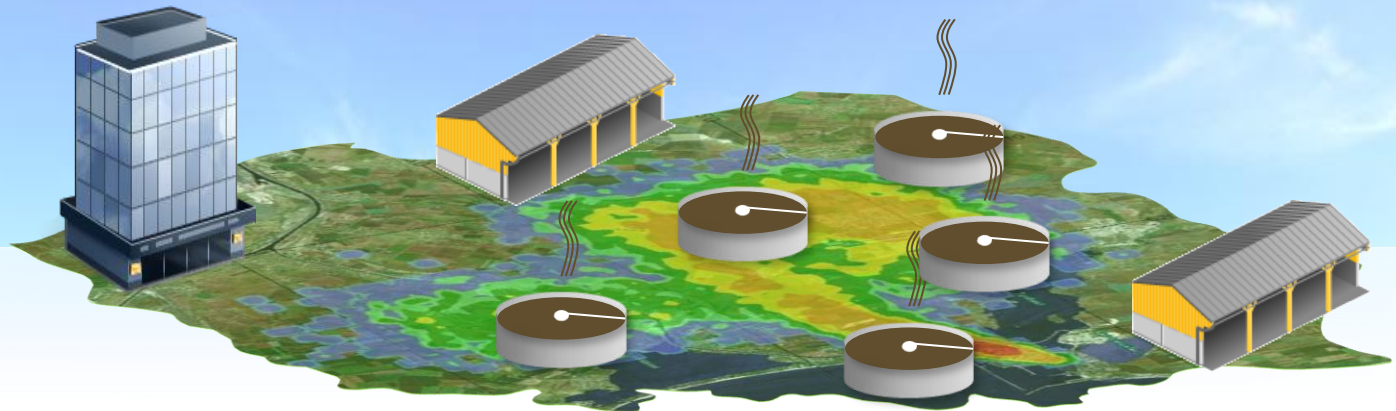
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REMINDER :

Odour unit = 1



**Detection threshold
of the human nose**

Order of magnitude :

A cup of coffee = 300 o.u.

WWTP = 15000 to 20000 o.u.



Identifying odour sources

Olfactometric measurement

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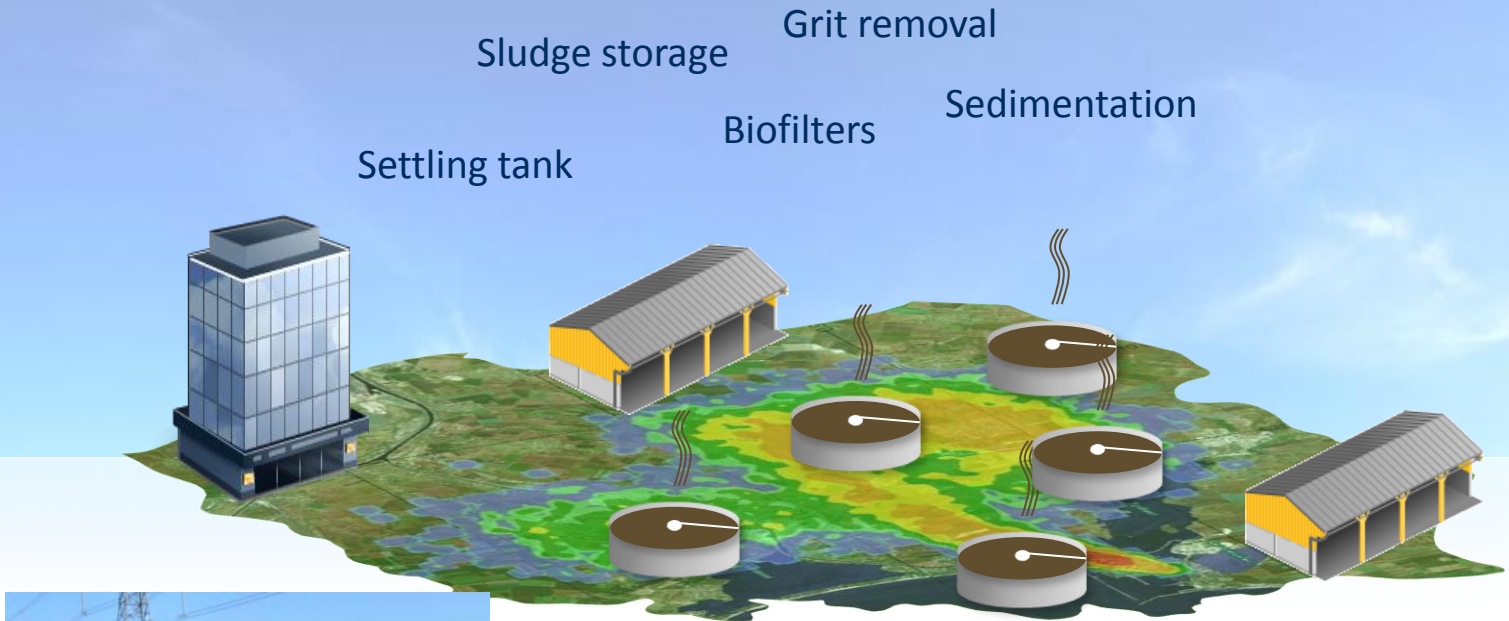
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In-Field measurement : with a portable olfactometer

In lab measurement : sample in tedlar bag and
olfactometric analysis in laboratory





Identifying odour sources

eNose measurement

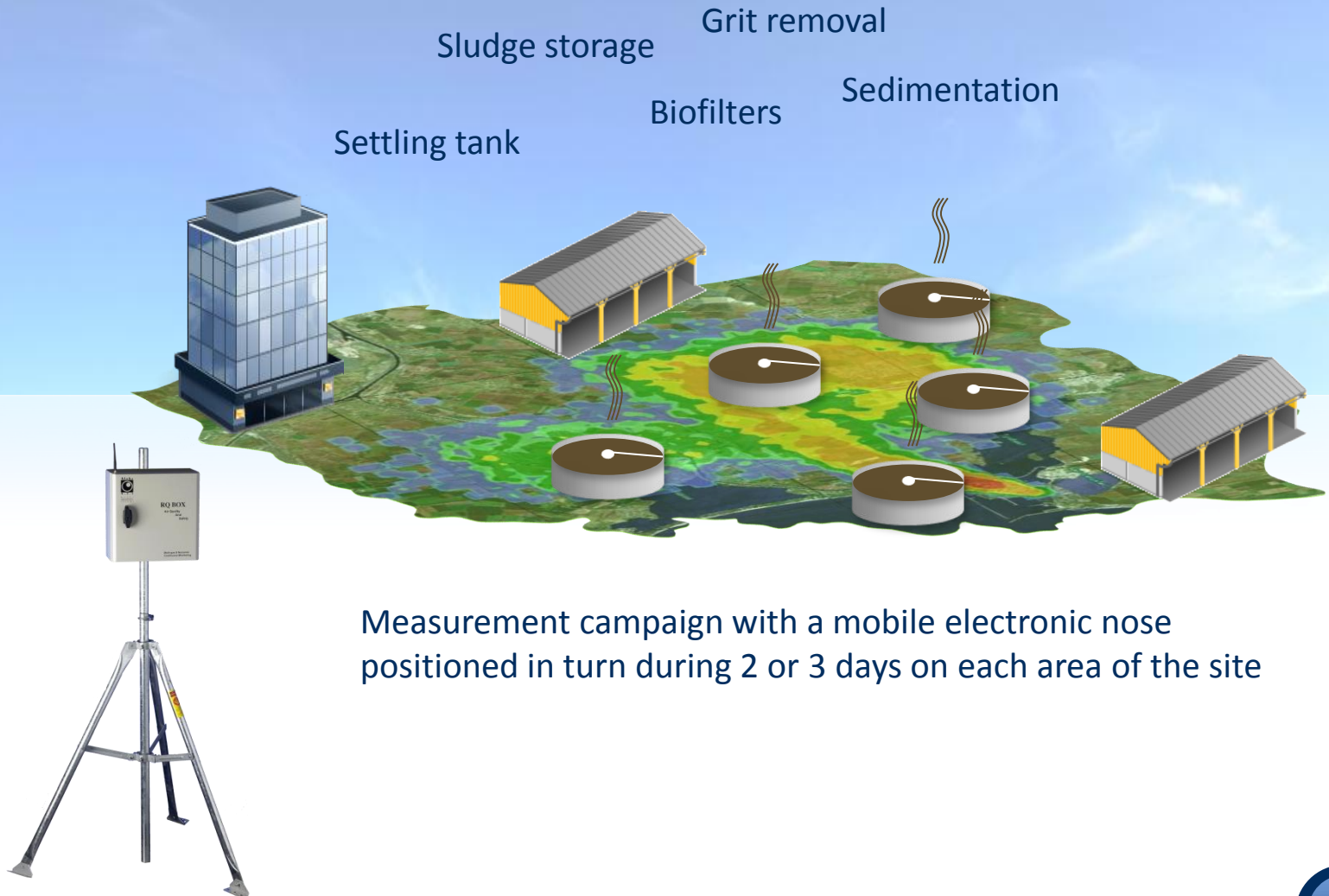
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Measurement campaign with a mobile electronic nose
positioned in turn during 2 or 3 days on each area of the site





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Elements of an eNose network installation





Daily monitoring

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RQ Box Analyzer

« Air Quality » Box



► 6 sensors

- **3 MOS** : odour units
- **1 PID** : VOC concentration in ppm
- **2 Electro-chemicals** : among H₂S, NH₃, mercaptans, concentration in ppm

► Pumping system

► Dust filter

► One measure each 10s

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Data Box



- ▶ Embedded computer
 - Memory card
- ▶ 2 communication modes for worldwide use
 - Cable : Ethernet
 - Wireless : GPRS



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Weather Station



- ▶ Integrated sensor suite
 - Wind speed and direction
 - Pluviometry
 - Temperature and relative humidity
 - Barometric pressure,
 - Solar radiation
- ▶ Solar panel and battery
- ▶ Display console
- ▶ Wireless communication





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Overall Architecture





Daily monitoring

eNose working principle



RQ Box
Air analyzer



Data Box
Data processing and transmission

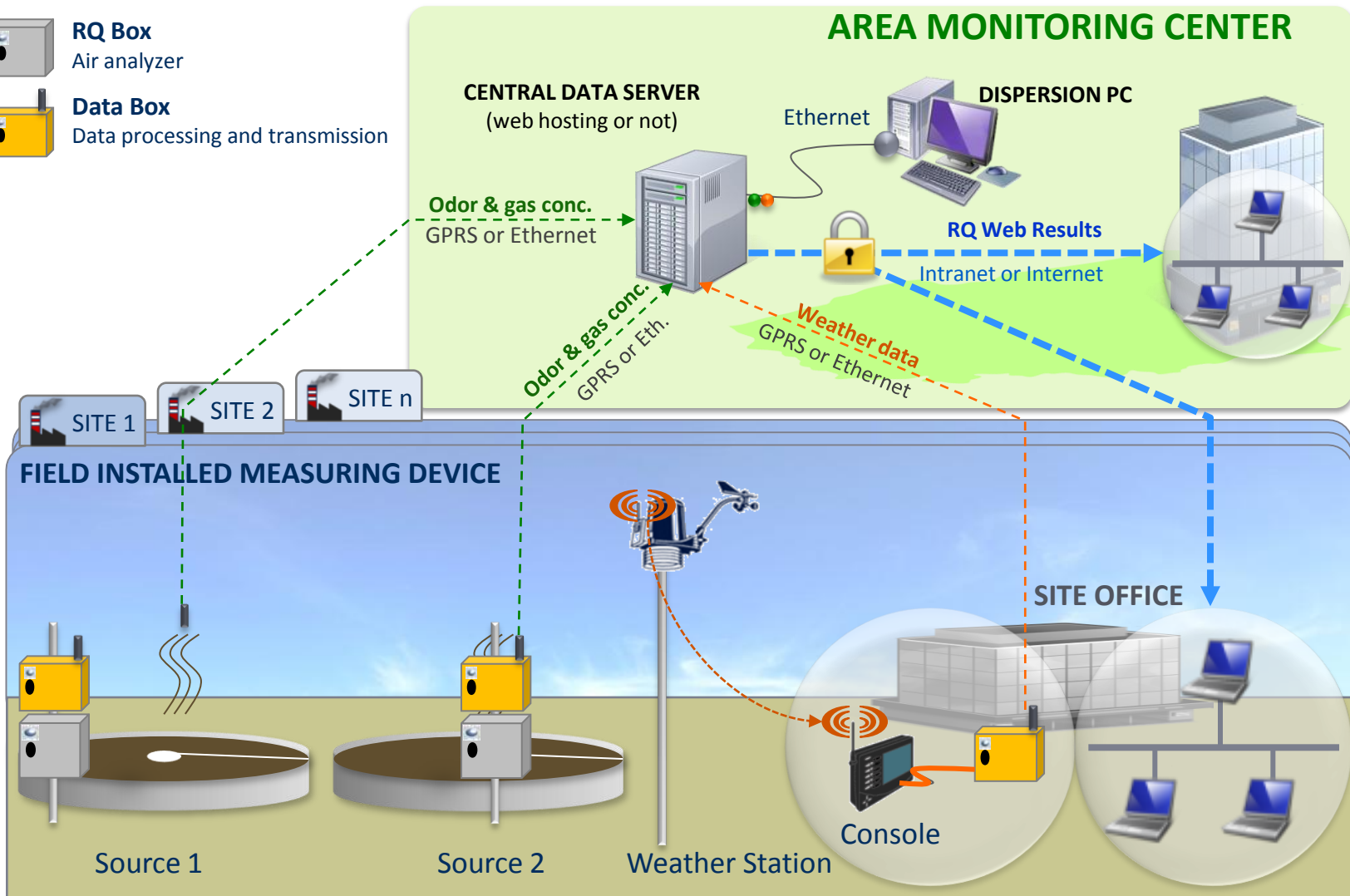
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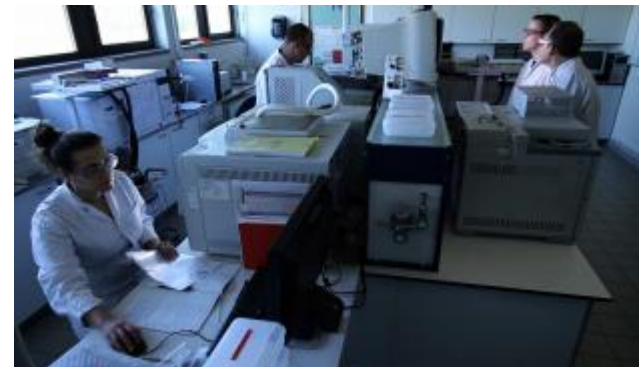


Daily monitoring

eNose working principle

Calibration

- ▶ As all sensors : odour sensor must be calibrated too
 - Olfactometric measurement (in field or in lab)
 - Injection of the results in the odour units calculus model

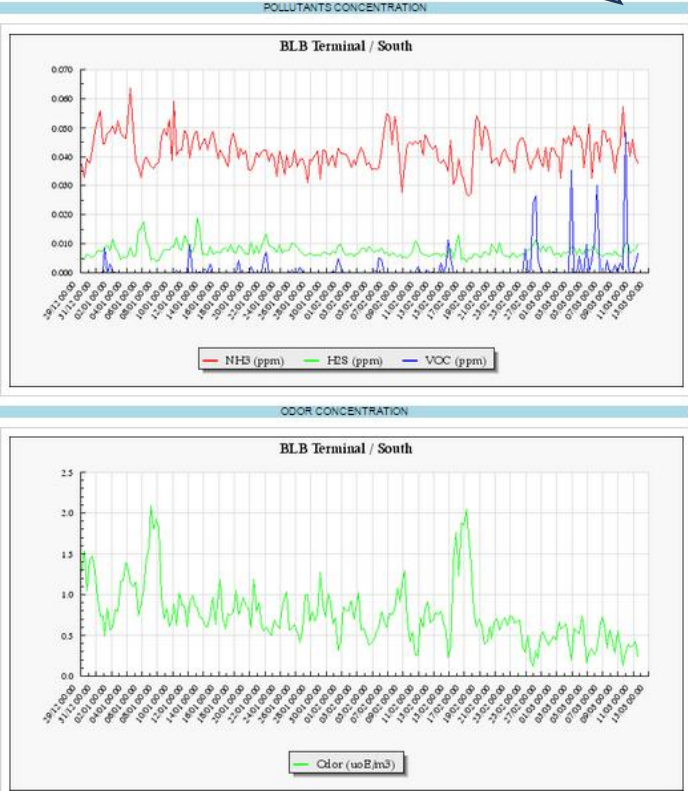


Daily monitoring

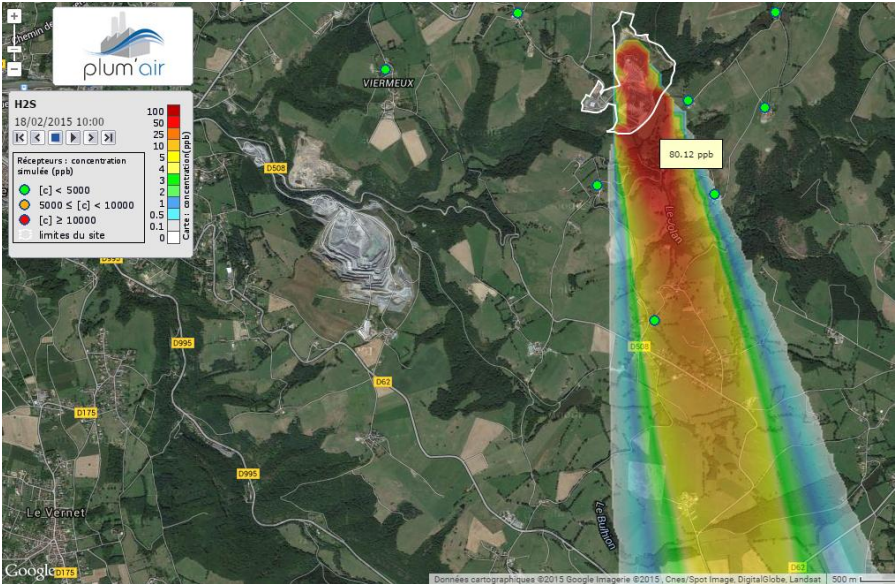
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Results

RQ Web : Charts



Plum'air : Dispersion



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Exploitation of results

Improving communication

► Anticipating odour nuisances

- Dispersion model with a 48h forecast mode
- Threshold alert on source : threshold exceeded on source → on average 1 to 2h delay before odour being detected by the neighbourhood

► Communication with the neighbourhood

- Communication about nuisances (by a web site, or calling...)
- Tool: history of all dispersion plumes



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Exploitation of results

Optimization of treatment solution

- ▶ Costs reduction for chemical additives for odour treatment
 - Servomechanism electronic card 4-20 mA on RQ Box
 - Treatment system activation (ex : misting ramp) only when needed
- ▶ Payback possibility : less than one year



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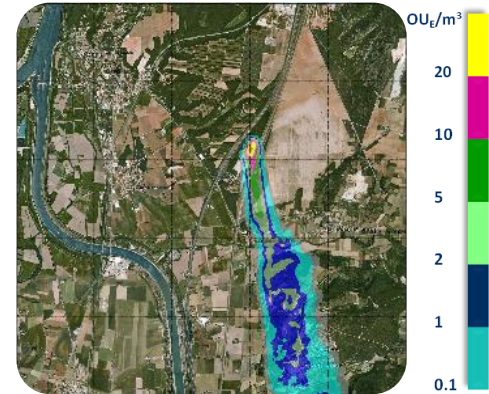
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► Challenges :

- To identify odor sources
- To better understand the mechanisms of odor dispersion
- To obtain instrumental results, correlated with the perception of local residents
- To assess the odor footprint of the site in real time
- To rely on historical measurements to communicate with local residents and community



► Solution :

- One electronic nose with a dispersion modeling software

► Results

- Continuous instrumental measurement correlated with the perception of local residents
- One of the decisive elements in the site's extension authorization
- Easy-to-understand results, available in real time
 - Better process control allowing the limitation of nuisances
 - Real time alerts when thresholds are exceeded
 - Saving time for the monitoring of nuisances
 - Easier communication with local residents and authorities





Feedback on eNose

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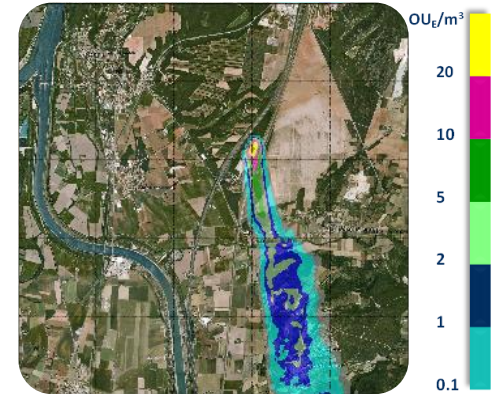
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«The dynamic odor maps [...] reflect the odor intensity perceived by local residents very well. This allows us to directly assess the impact of our activities on the neighborhood. Obtaining these observations more easily, allows us to devote more time to the development of preventive or corrective actions to reduce potential nuisances.»

Fayçal Hassad, Site Manager



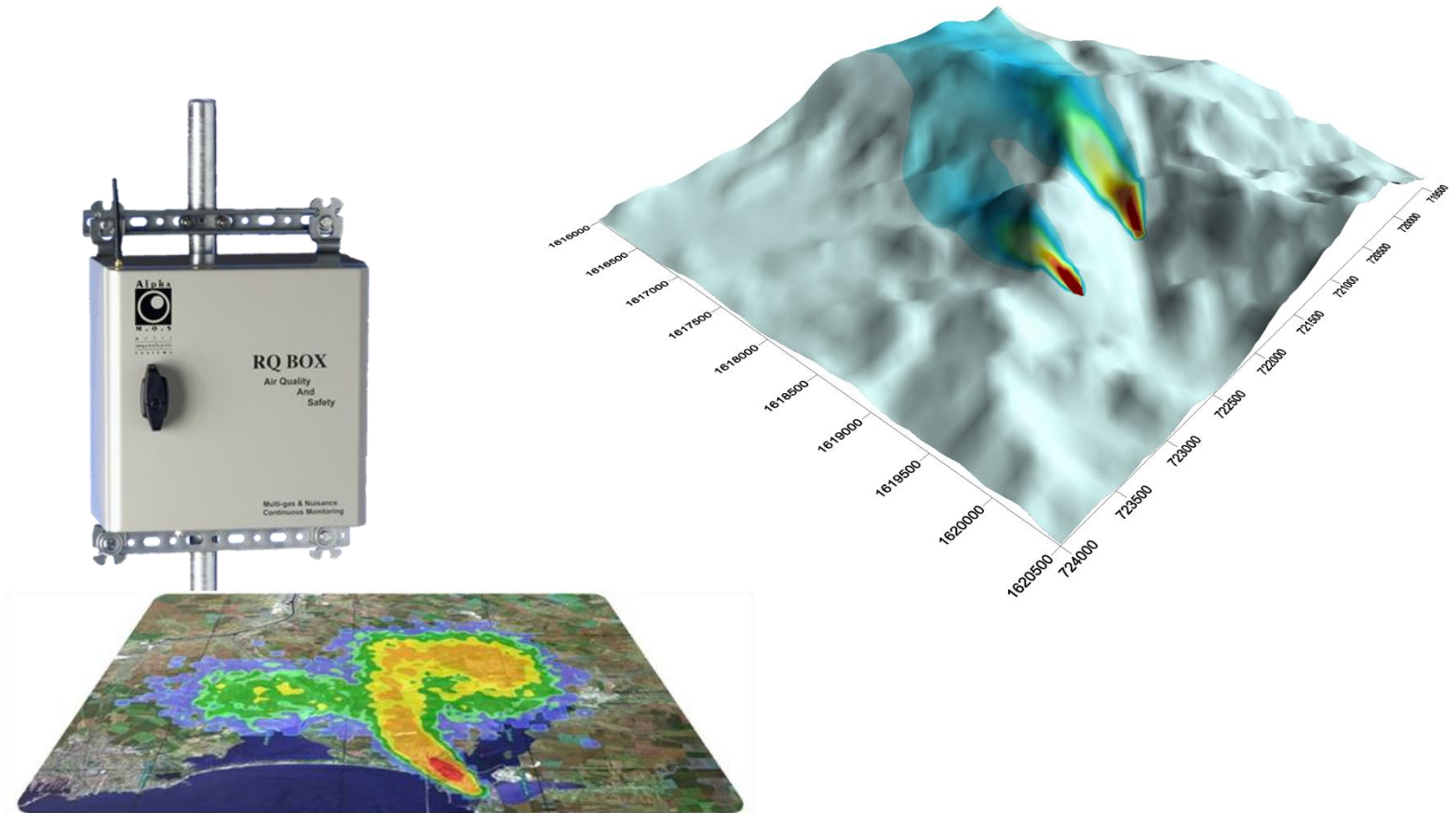
Mr. Fayçal Hassad's feedback :

Daily use

Global feedback on eNose



Thank you for your attention !





Contact



Alpha M.O.S

Multi Organoleptic Systems

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