



Experiences with Next Generation Technologies

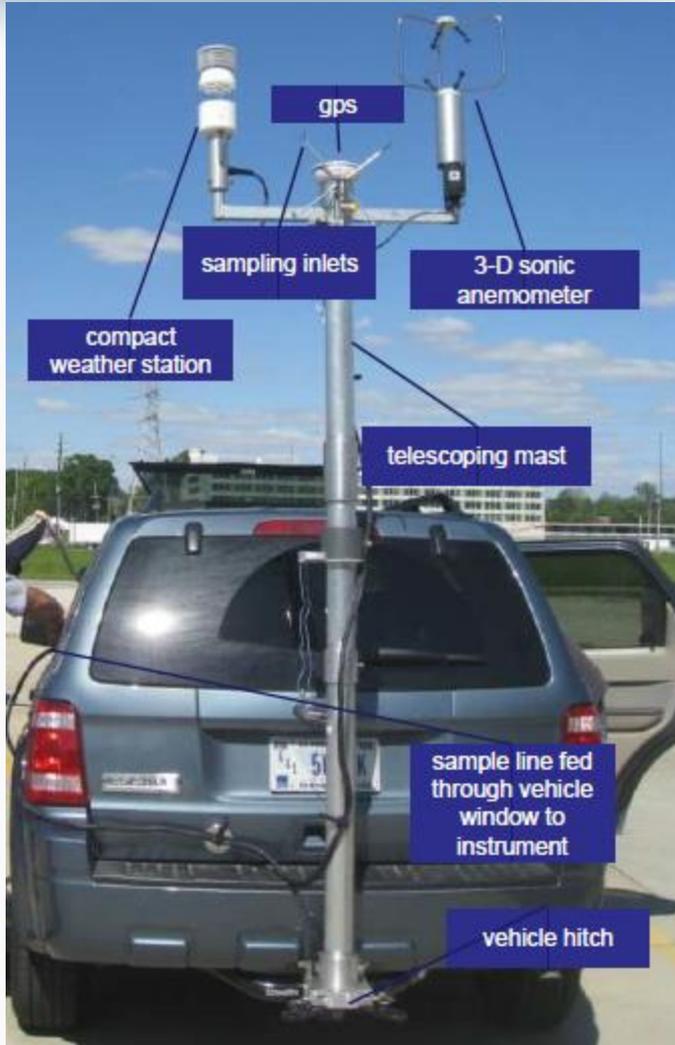
Motria Caudill, PhD
EPA Region 5 – Chicago
August 14, 2014

NextGen technologies in R5

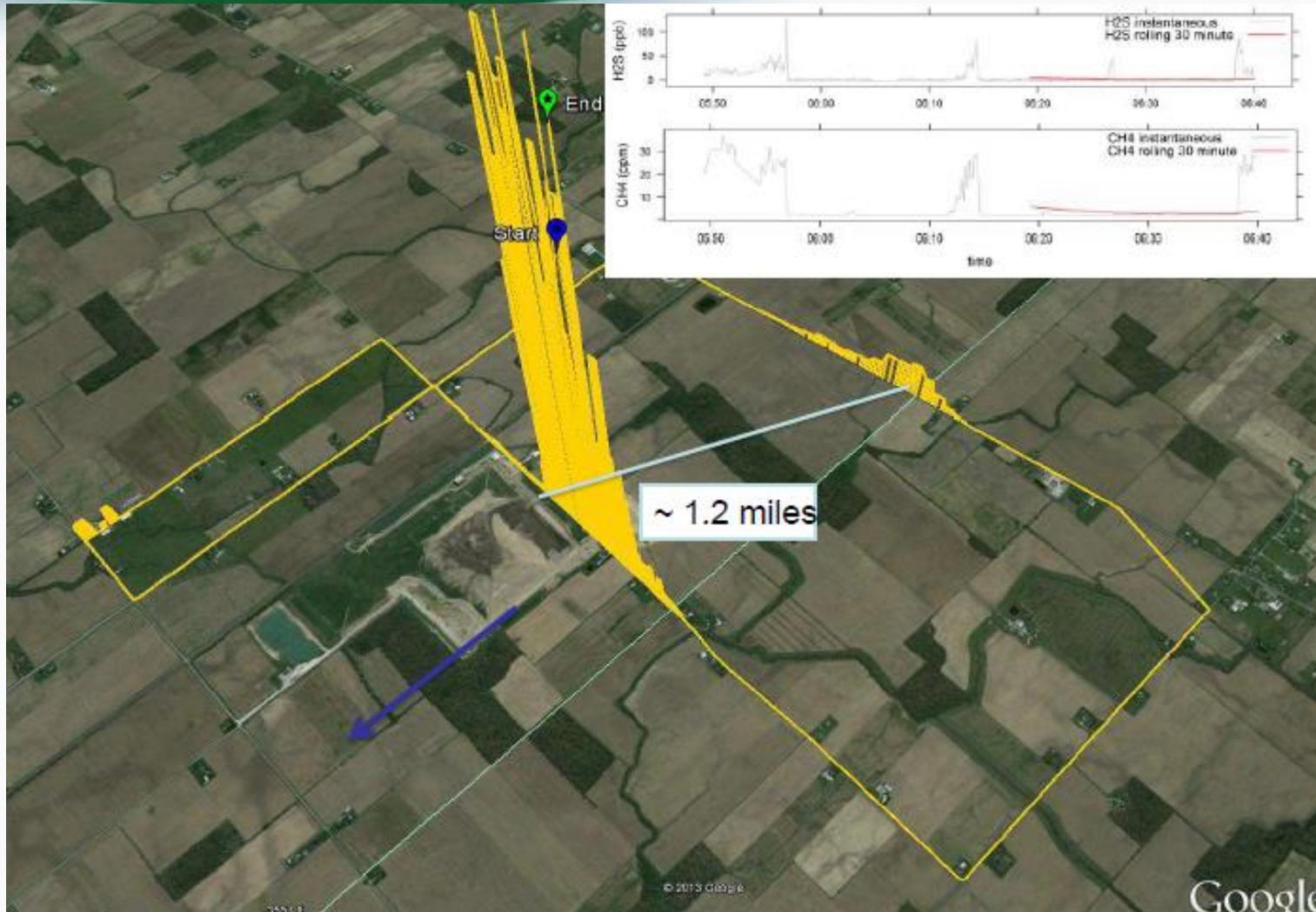


- Geospatial Measurements of Air Pollution (GMAP) system equipped with Cavity Ring-down Spectroscopy (CRDS) for real-time H₂S & CH₄
- Xact 625 Fenceline Monitor for 1-hour near-real-time measurement of 23 trace metals and minerals via built-in XRF instrument
- Passive tubes for 1-2 week integrated sampling of VOCs with TO-15 analysis at EPA-ORD

GMAP system in action



Real-time CH₄ ribbon plot shows peaks downwind of landfill



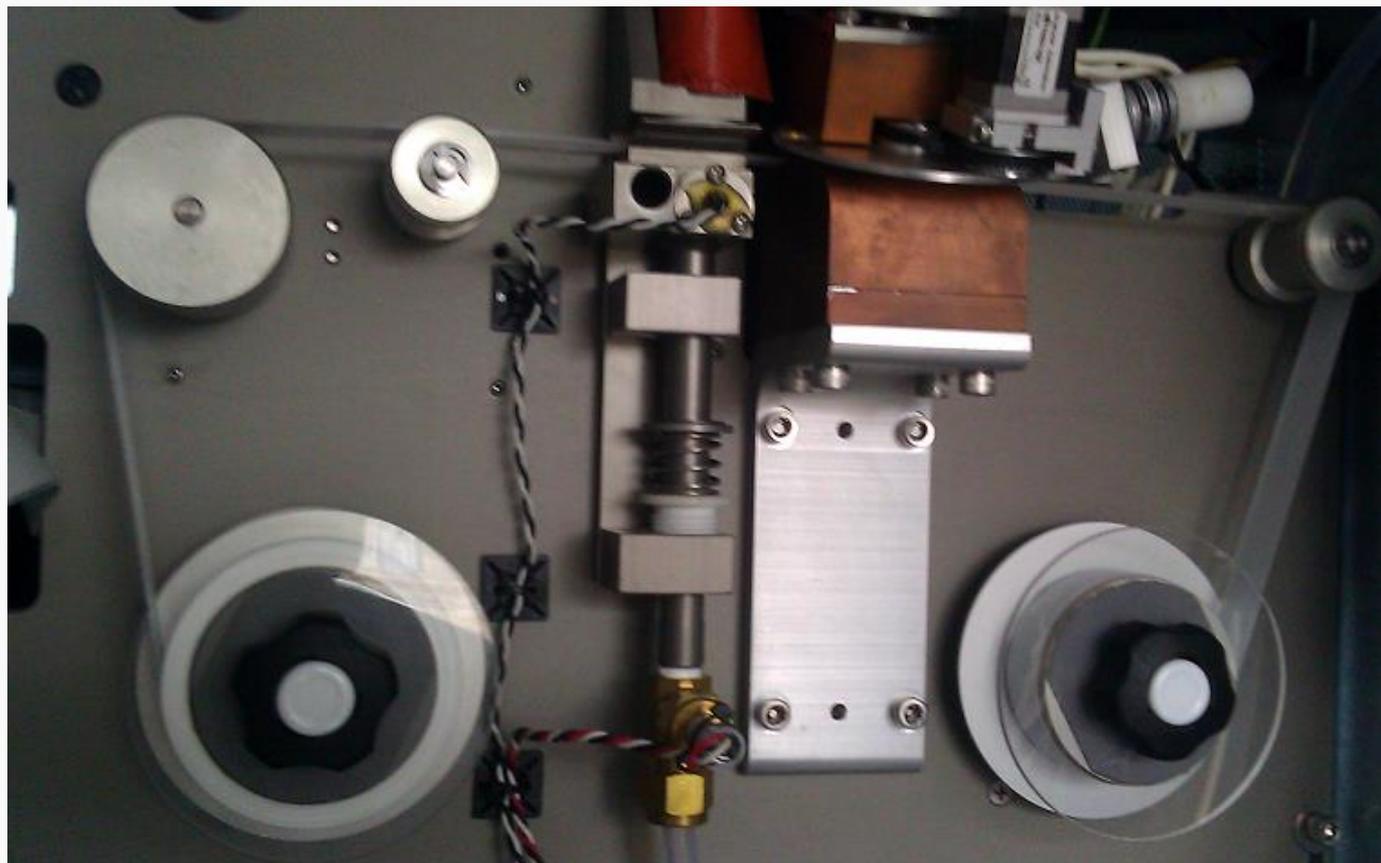
Claim to fame: imminent and substantial endangerment finding (Sec. 303) due to H₂S leak in Detroit



Metals trailer in action



Reel-to-reel metals filter tape



Site deployment and O&M



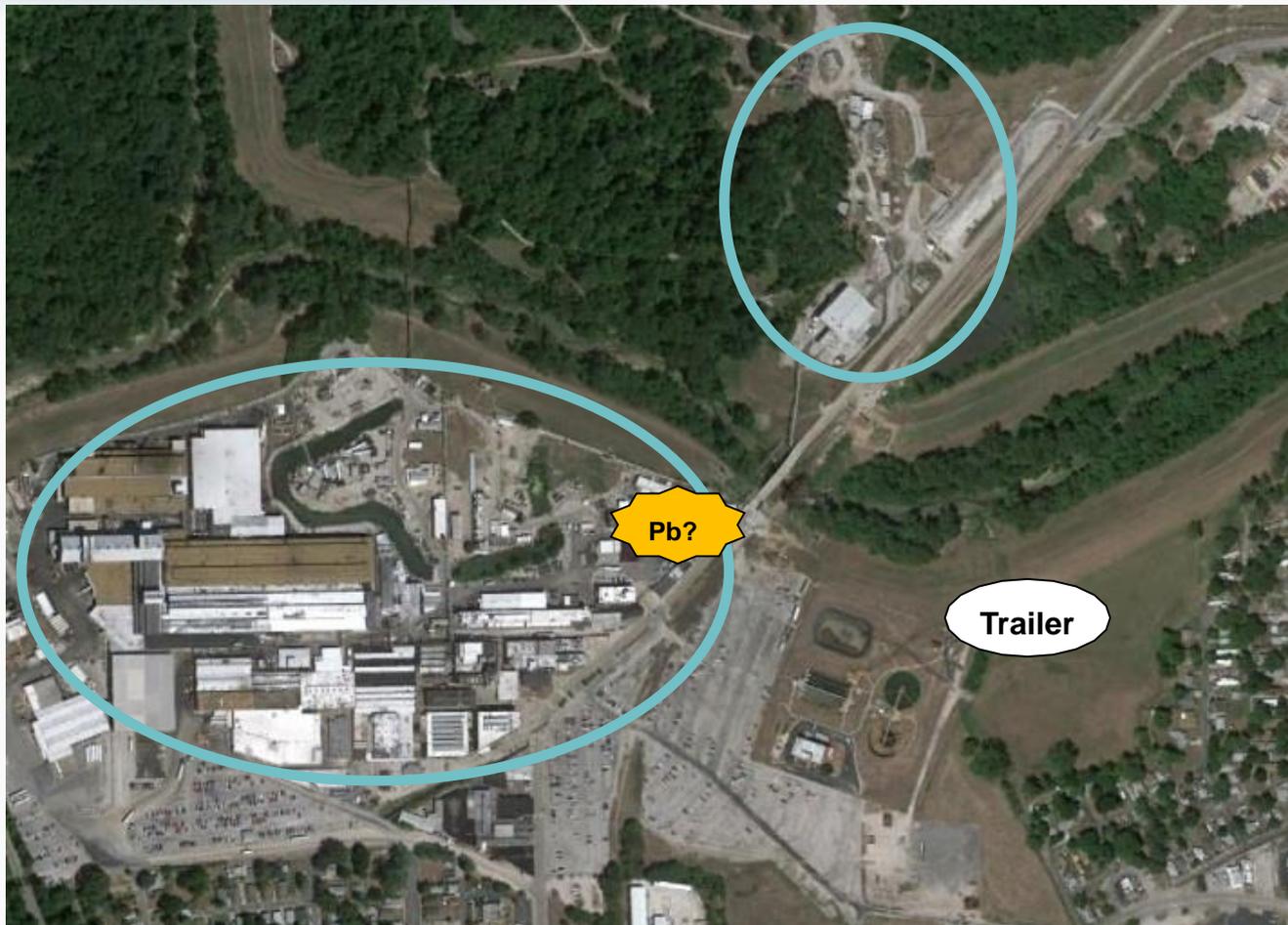
- Our current approach: short-term (3-6 month) studies
- Advance visit(s) needed to secure site access and get a quote for electrical installation
- Every time we move the trailer, 3-5 days of staff time and \$2-4K needed for electrical installation
- Once system is running, filter tapes are changed once every 3 weeks. Local monitoring agency can be trained to change tapes.
- There are additional costs to maintain the system – annual purchase of filter tapes, flow certification

Metals deployments to date

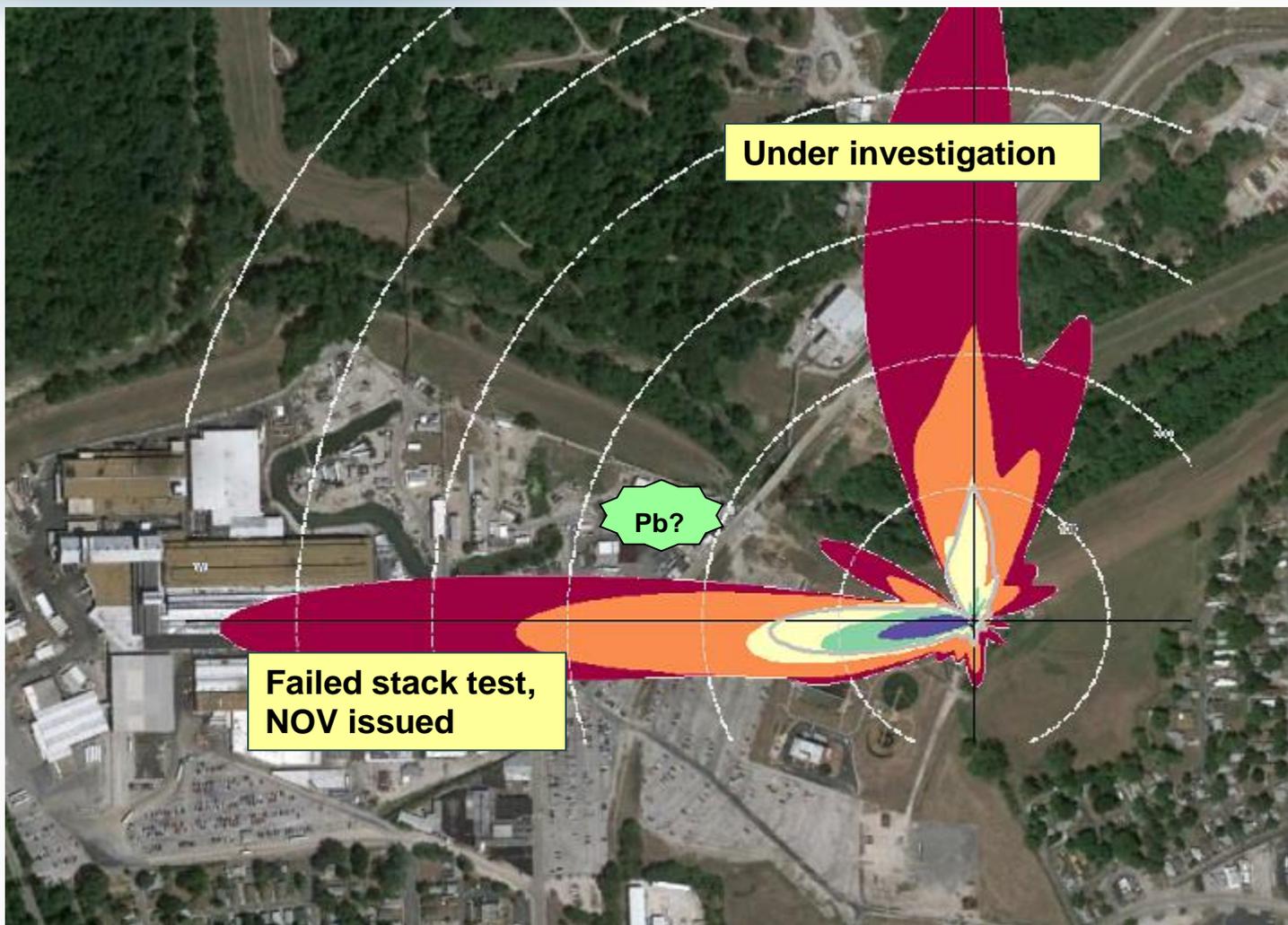


- 3 studies of facilities that may violate Pb-NAAQS
 - Two showed elevated Pb in ambient air. Both have ongoing enforcement actions. Hourly metals & met data helped pinpoint Pb emitting processes.
- 3 studies of known high-Mn areas
 - Two gave useful information about specific Mn emissions points at large metallurgic operations.
 - Potential data uses:
 - Ongoing enforcement case (monitored site & others)
 - Voluntary reductions (monitored site & others)
 - Recommendations to OAAQPS for future rulemaking

Facility "X" – Suspected Pb emissions point & trailer site



Pb pollution rose, follow-up



Metals - challenges



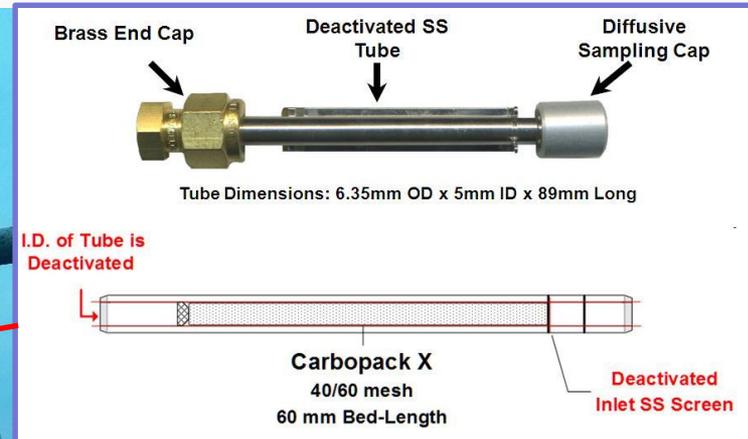
- Barring a 3-month Pb NAAQS exceedance, we don't have a regulatory "hook" for air enforcement
- Leading inspectors to emissions points where they find PM/Pb violations gives a murky "success story"
- Manganese is a lower priority since its toxicity suddenly dropped 6-fold: EPA replaced our 0.05 ug/m³ RfC with ATSDR's 0.30 ug/m³ MRL

Metals - next steps



- R5 is struggling to justify future funding of the metals trailer. My positive spin: this technology is bigger than just our Region! It's a valuable resource for the Agency as a whole.
- We are investigating options to collaborate with other EPA organizations for special investigations – Regions, NEIC, ORD, State/Locals. The trailer should be in a nation-level pool of technological resources.

Passive VOC tubes in action



Region 5 component of ORD RARE
& Regional Method Development

VOCs - next steps



- R5 field study was a success. Results are pending.
- We are starting a new R5 study to compare collocated passive tubes vs. canisters vs. auto-GC
- Potential future sampling for community-based or enforcement related work
- More to come..



FEDERAL REGISTER

The Daily Journal of the United States Government

Proposed Rule

Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards

A Proposed Rule by the Environmental Protection Agency on 06/30/2014



[Method 325A—Volatile Organic Compounds From Fugitive and Area Sources](#)

THANK YOU!



- Questions on GMAP, contact Marta Fuoco (fuoco.marta@epa.gov, 312-886-6243)
- Questions on metals trailer, contact Motria Caudill (caudill.motria@epa.gov, 312-886-0267)