FUGITIVE EMISSIONS SUMMIT AMERICAS

2022

Geospatial Measurement of Air Pollution: The GMAP

SPONSORED BY: Bray EMERSON MRC Global TEADIT ZWICK

Dylan Orr – TRICORD Consulting

Introduction

Today we will cover:

1. GMAP technical overview
2. The EPA and the GMAP
3. GMAP industry applications

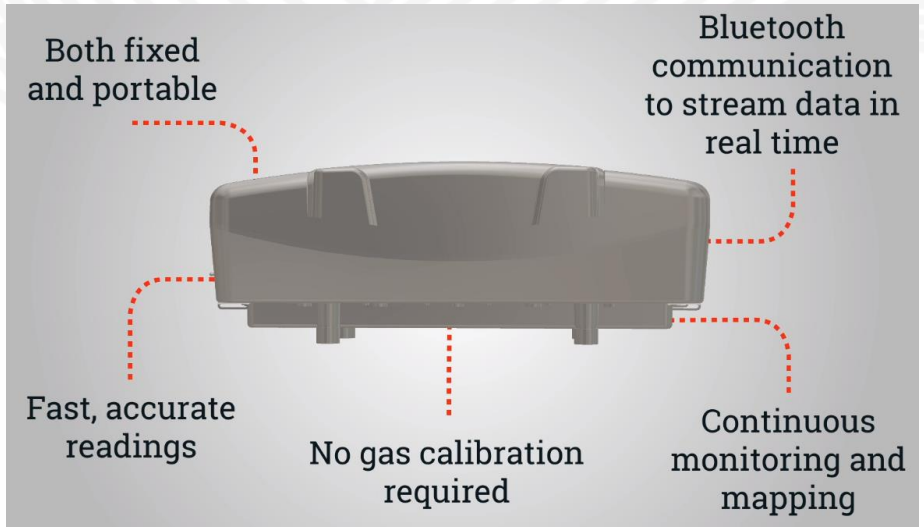
The Vehicle

- The GMAP is a high tech mobile air quality monitoring vehicle
- Ability to cover large areas in a short amount of time

Dylan Orr – TRICORD Consulting

Inside the GMAP

- Multi-pass UV optical spectrometer provides 1 second interval of real time data
- Low detection limits able to analyze 14 constituents at the ppb (parts per billion) level



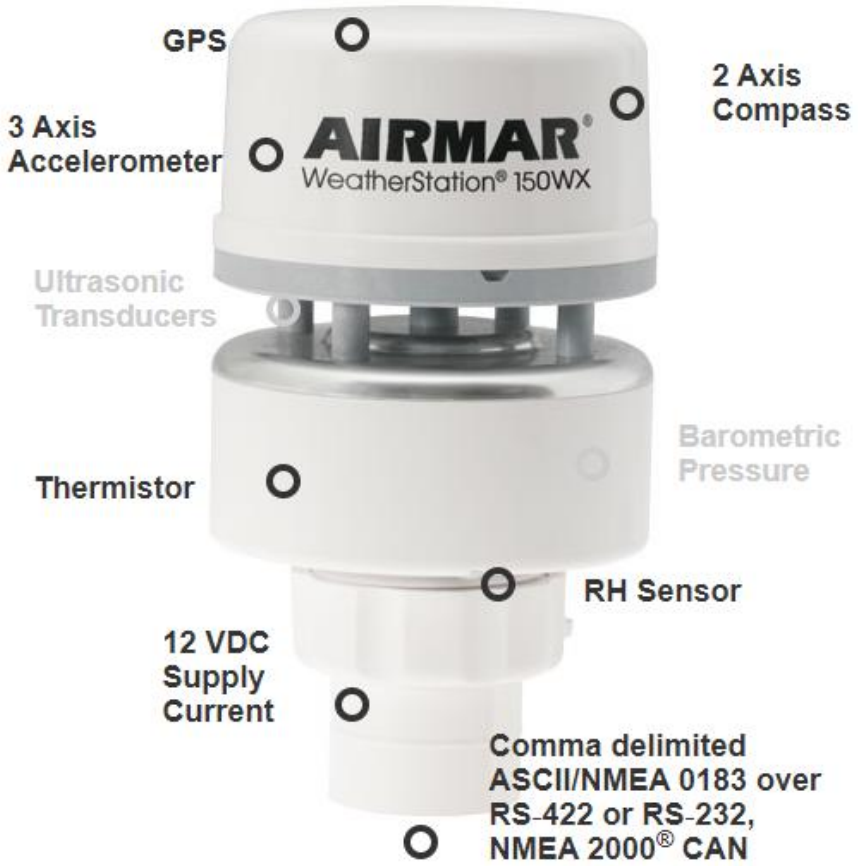
Detectable Compounds

Chemical	Range (ppb_v)
VOC[1]	5 – 2,000,000
Benzene	2 – 1,000
Toluene[2]	5 - 250
Ethylbenzene[2]	5 - 500
m-xylene[2]	5 - 500
o-xylene[2]	5 - 500
p-xylene[2]	2 - 250
Ozone	5 - 500
Nitric Oxide	2 - 500
Sulfur Dioxide	2 - 500
Nitrogen Dioxide	15 – 1,000
Styrene	2 - 250
Ammonia	2 - 250
Formaldehyde	17.5 – 1,000
1,3-Butadiene	5 - 500

(1) The VOC monitor is a Photoionization detector (PID) and is separate of the DV3000 monitoring device.
(2) The DV3000 Manufacturer suggests limits of chemical in the 2-500 ppb level. U.S.EPA experience suggests higher, sometimes significantly higher values are expected.

Inside the GMAP

- Real-time meteorological and geospatial monitoring
- GPS allows the GMAP to track position and speed over the ground
- A met station tracks wind speed and direction

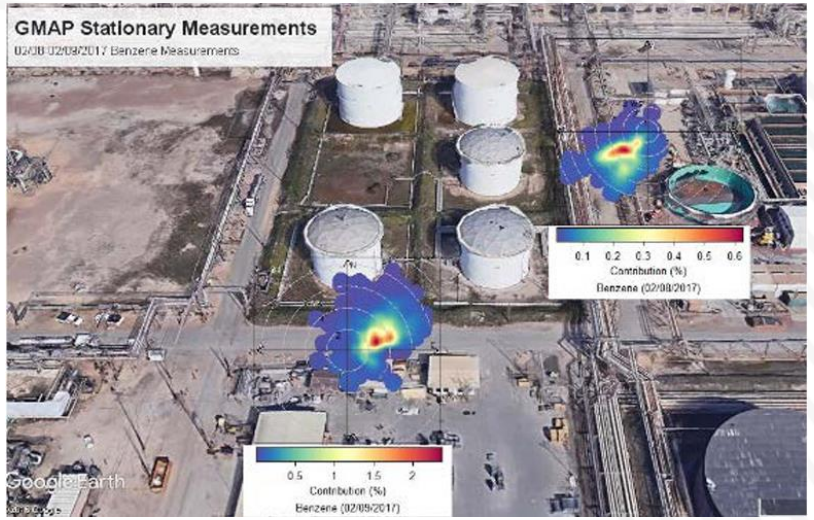


Mapping Capabilities

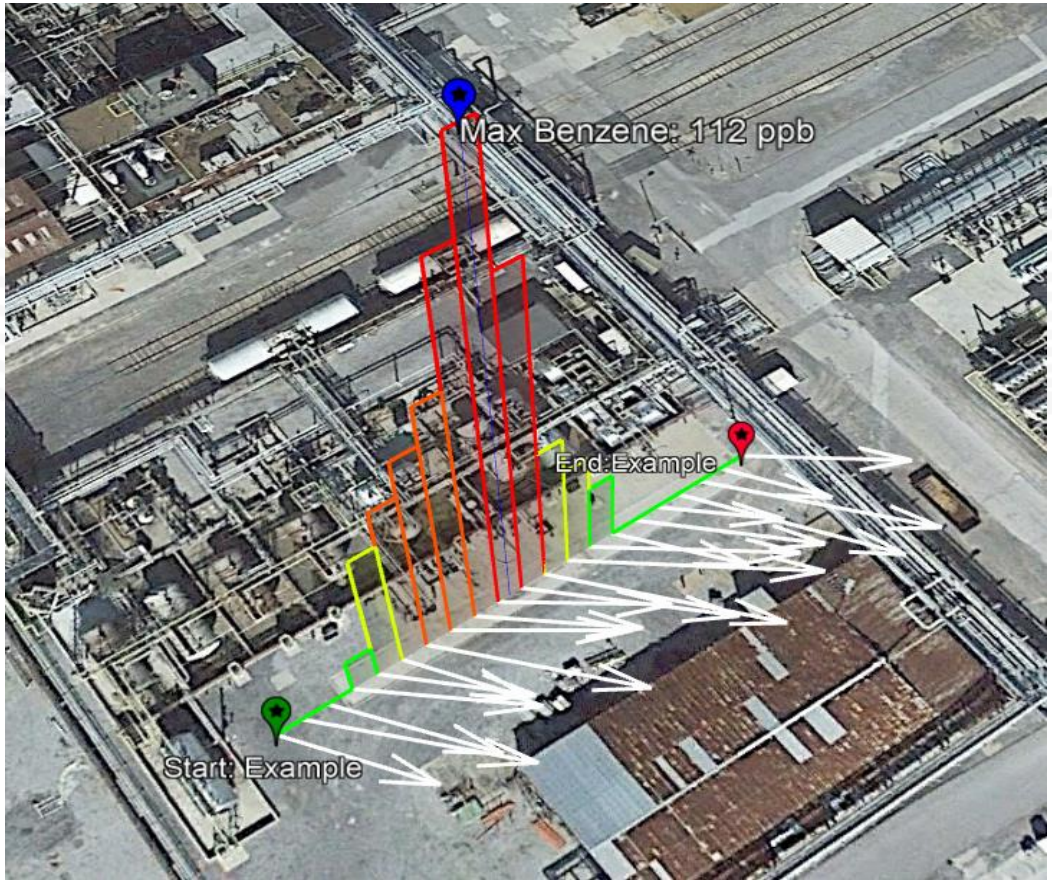
- Overlays a satellite image with data captured by the UV spectrometer, GPS, and met station
- Maps can be generated within minutes!

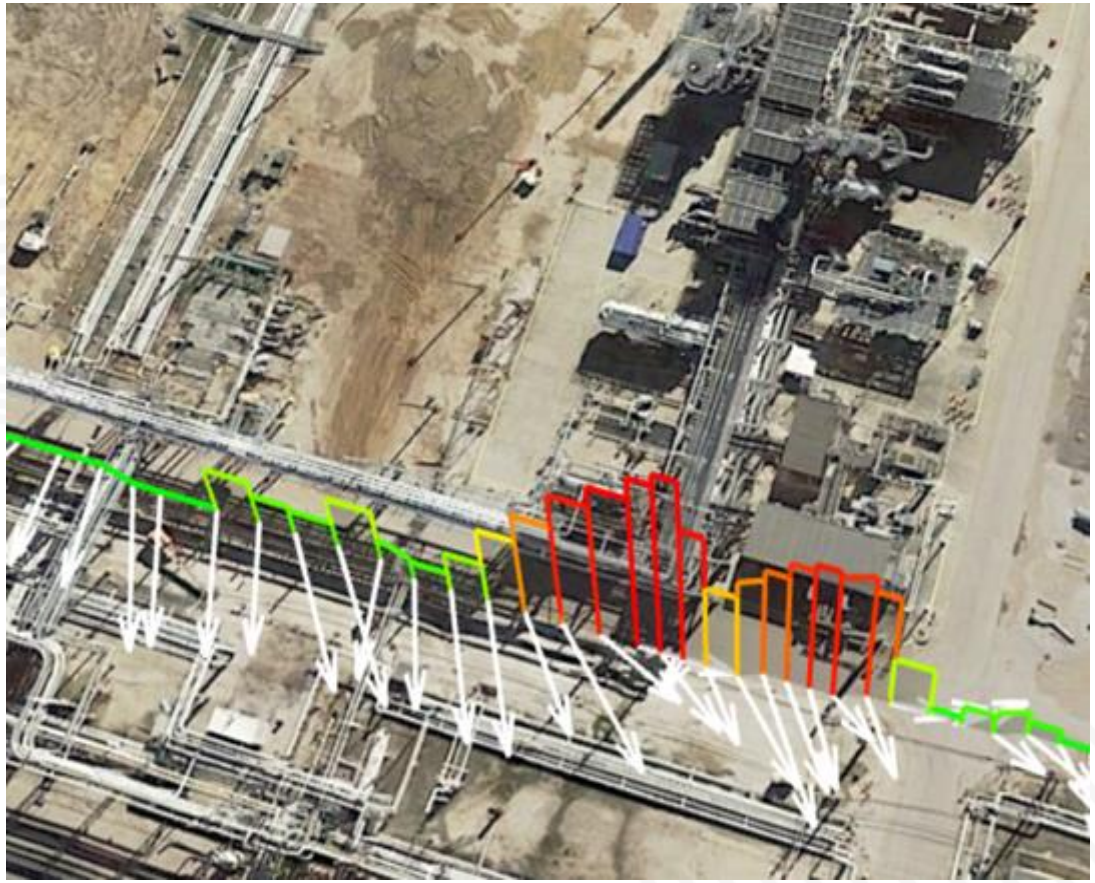
Mapping Capabilities

- Mobile mapping results display wind direction, speed, and relative concentration to identify sources
- Stationary mapping results used to generate polar plots
  - Illustrate the direction to the source
  - Shows relative concentration
- Used to isolate and attribute sources to specific facilities



Additional Map Examples





Additional Map Examples

Dylan Orr – TRICORD Consulting

The EPA and the GMAP

- In early 2022 the EPA launched the Pollution Accountability Team (PAT)
- Mission to provide strong environmental compliance using the GMAP
- EPA will be exercising right to conduct unannounced inspections
- Targets are going to be any facilities within a few miles of:
  - Schools
  - Public parks or event centers
  - Anywhere with heavy civilian foot traffic

Application to Industry

- GMAP can be valuable in defending against a surprise inspection
  - Fortify fence line monitoring
  - Identify foreign emissions
- Support GMAP with boots on ground tactics to find and pinpoint major sources inside the fence line
  - OGI (Optical Gas Imaging) Cameras
  - Hydrocarbon analyzers
- Use the GMAP to oversee different events or repeat sources:
  - Barge or railcar loading/unloading
  - Blast pad activities
  - Vehicle loading stations
  - General maintenance
  - Tanks
  - Sumps
  - Vapor Recovery Systems
  - Sewer Systems

More Examples

- Pre-screen monitoring in preparation of planned agency GMAP monitoring.
- Comparative monitoring during agency GMAP monitoring.
- Support for negotiating Consent Decrees with FLM.
- Support of FLM studies and FLM program implementation.
- Routine supplemental monitoring (e.g., quarterly screening of equipment) as an enhancement to existing LDAR, BWON, FLM, and Community Relations Management programs.
- Baseline community monitoring.
- Offsite monitoring during an emission event.

Conclusion

- With the technological potential and advantages of the GMAP, it is going to be the next generation for air quality monitoring.
- Be prepared to defend against a surprise inspection by the EPA!

Thank you!
Any Questions?