



EPA Vapor Intrusion Workshop

Measurement-Based Methods for Protective & Defensible Chlorinated VI Exposure Determinations

**New and Currently Available Instruments,
Including Multiple Sensor and Triggered-Sampling Systems**

Chase Holton, Ph.D., P.E.(co), Geosyntec



Please note...

*Mention of trade names and commercial products
does not constitute endorsements or
recommendation for use*

Agenda

- Data of Interest
- New and Currently Available Instruments
- Smarter Canister Sampling
- Considerations for ITS Data Collection
- Summary and Conclusions

Data of Interest

- Weather (Temperature, Barometric Pressure, Windspeed, Precipitation)
- Differential Pressure
- Radon, VOCs



New and Currently Available Instruments

- Instruments developed for VI practitioners and other industries and applications
 - Single to multiple capability systems
 - Customization
 - Continuous data collection and real-time monitoring
 - Wireless/remote access and datalogging capabilities
 - Weatherproof, tamperproof enclosures



(1) www.skinc.com, (2) www.ionscience.com

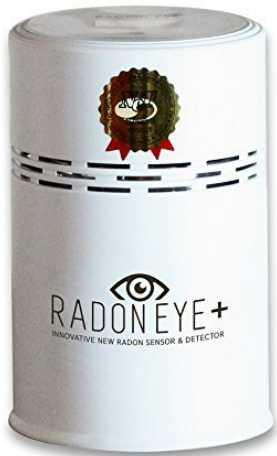
Differential Pressure Instruments

- Some coupled with flow meter and/or other sensors
- Continuous and real-time monitoring
- Remote connectivity



Radon Instruments

- Short- or long-term concentration values
- Continuous and real-time monitoring
- Remote connectivity

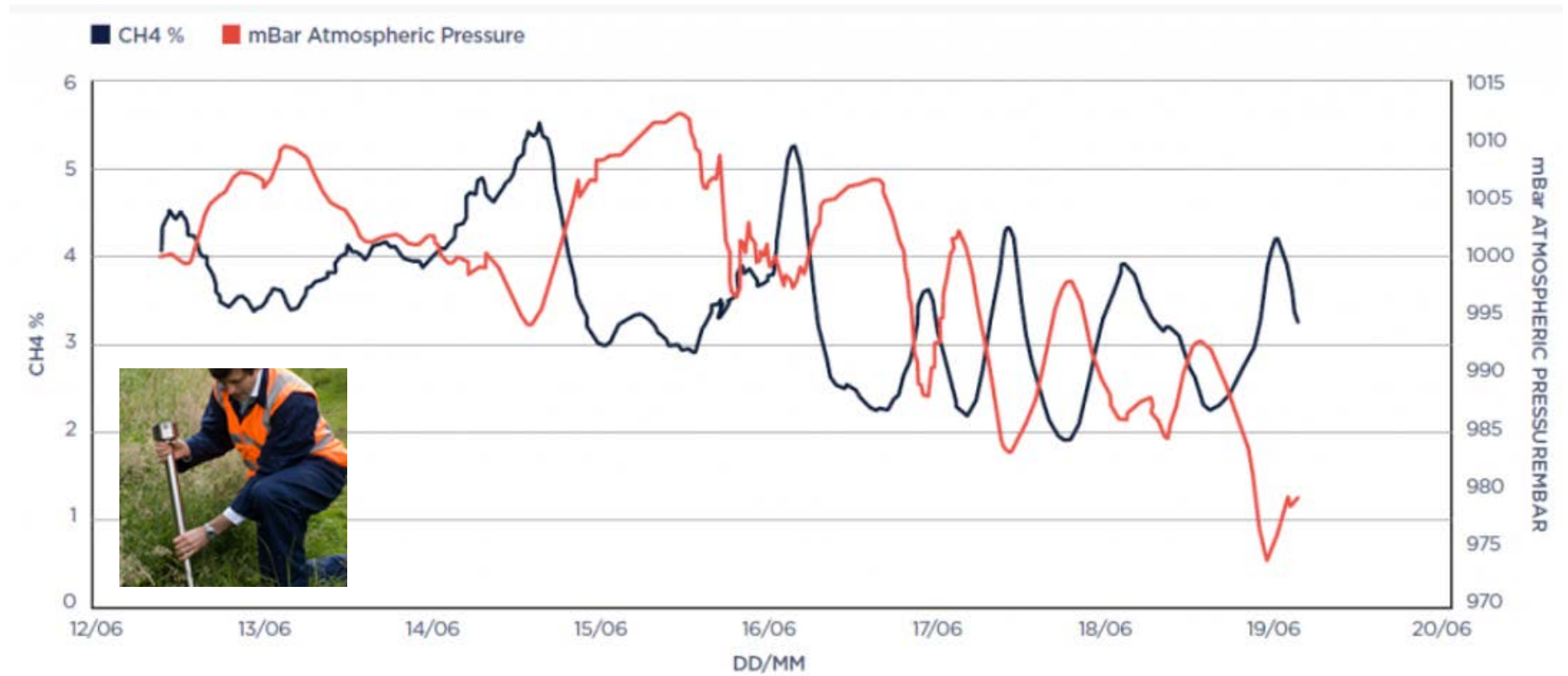


VOC Instruments

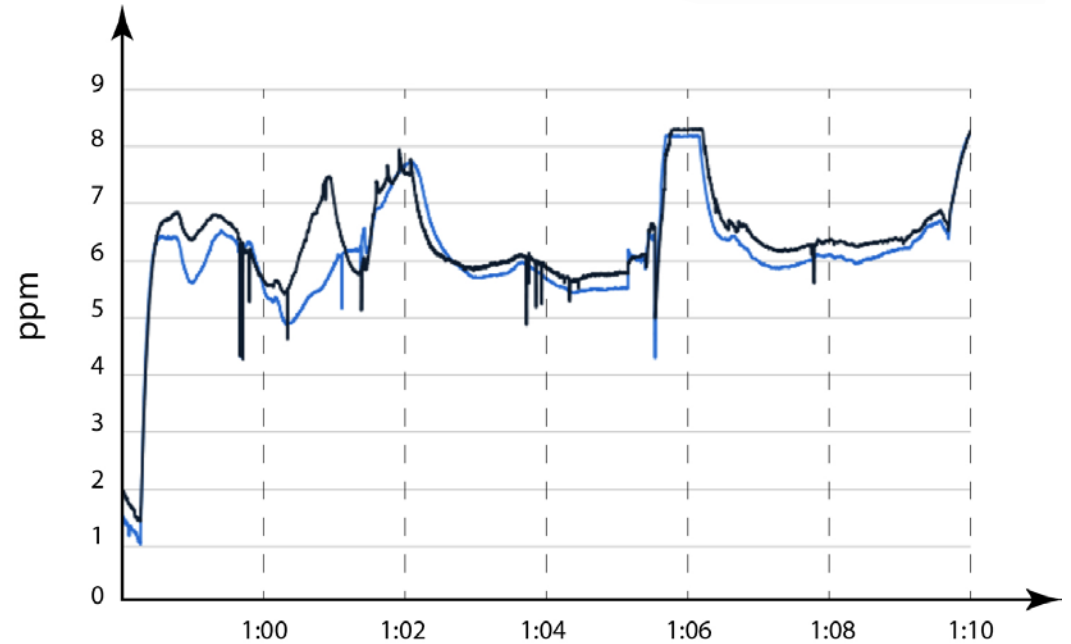
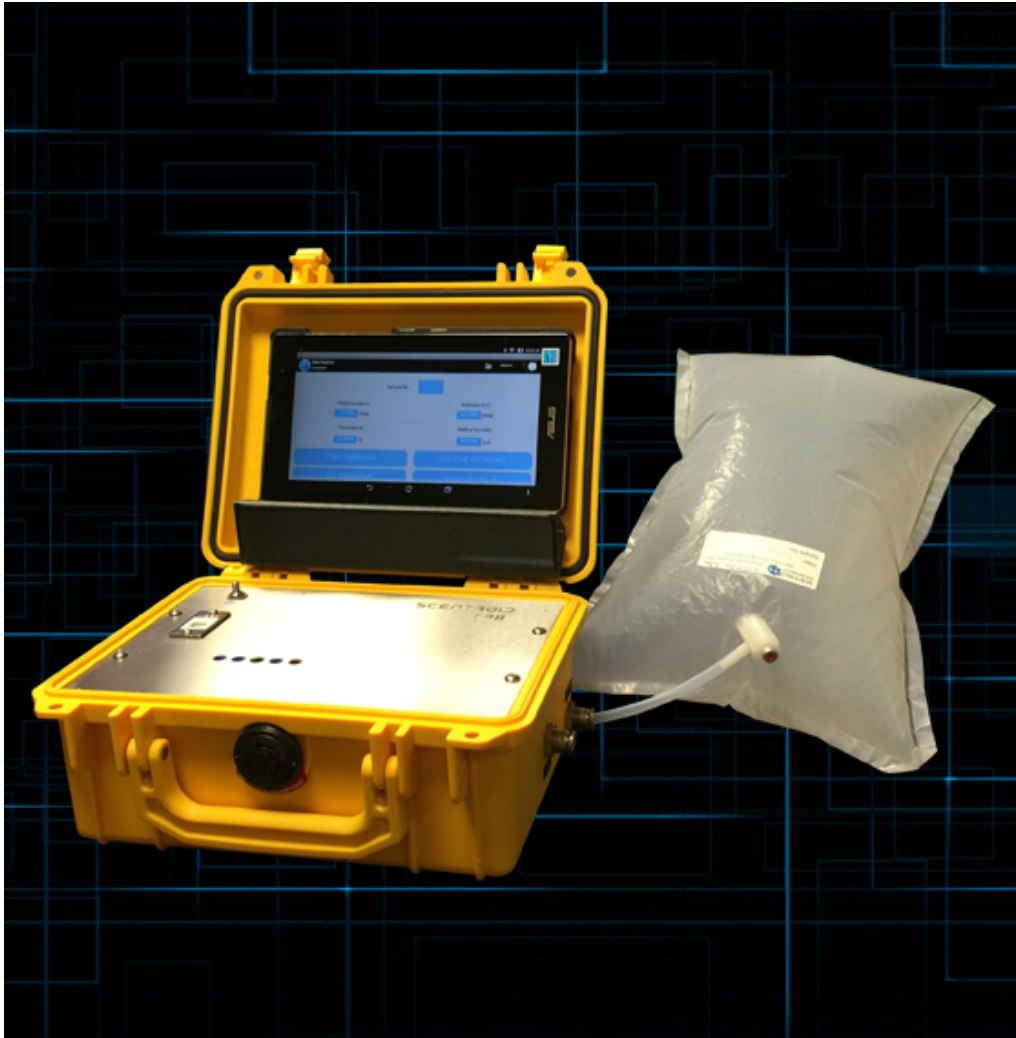
- Screening-level data, total or speciated VOCs
- Real-time monitoring and data logging
- Remote connectivity



Soil Gas Instruments

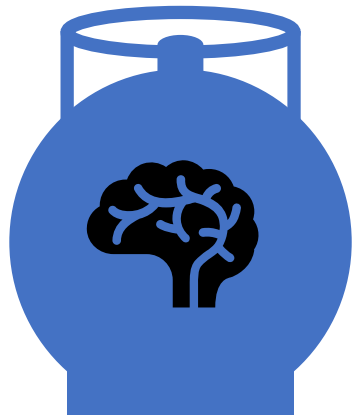


Other Instruments



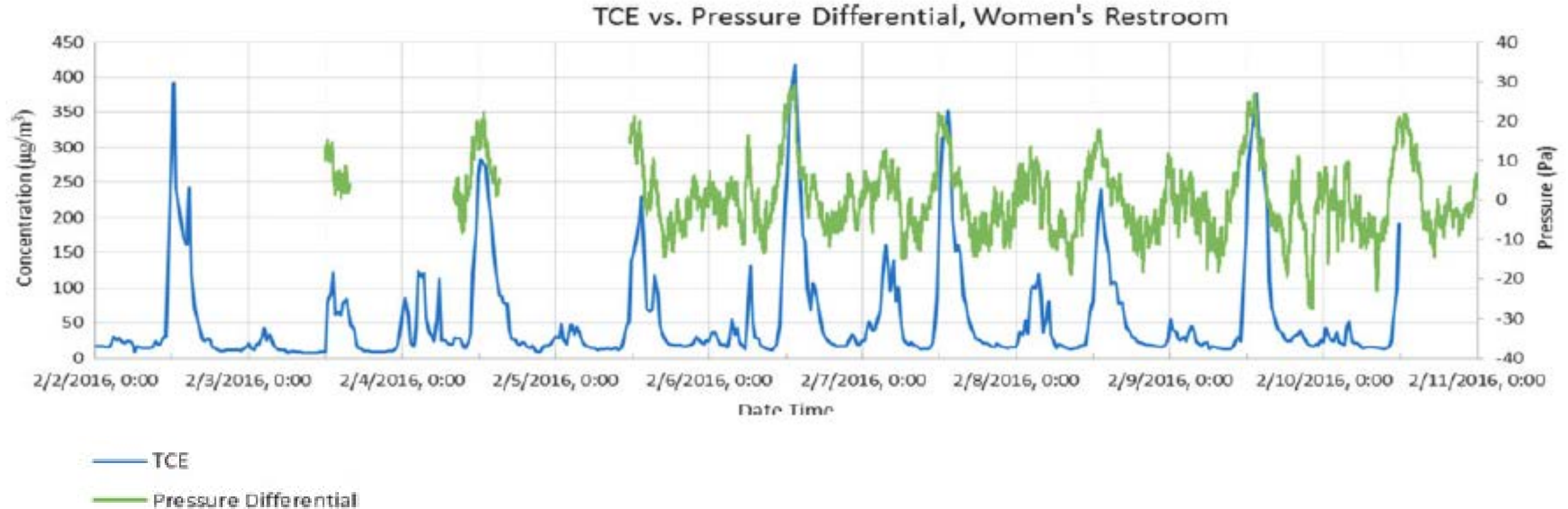
Smarter Canister Sampling

- Add-ons and New Approaches
 - Timed or scheduled sampling
 - Remote start/stop
 - Triggered- or Event-Initiated Sampling Systems

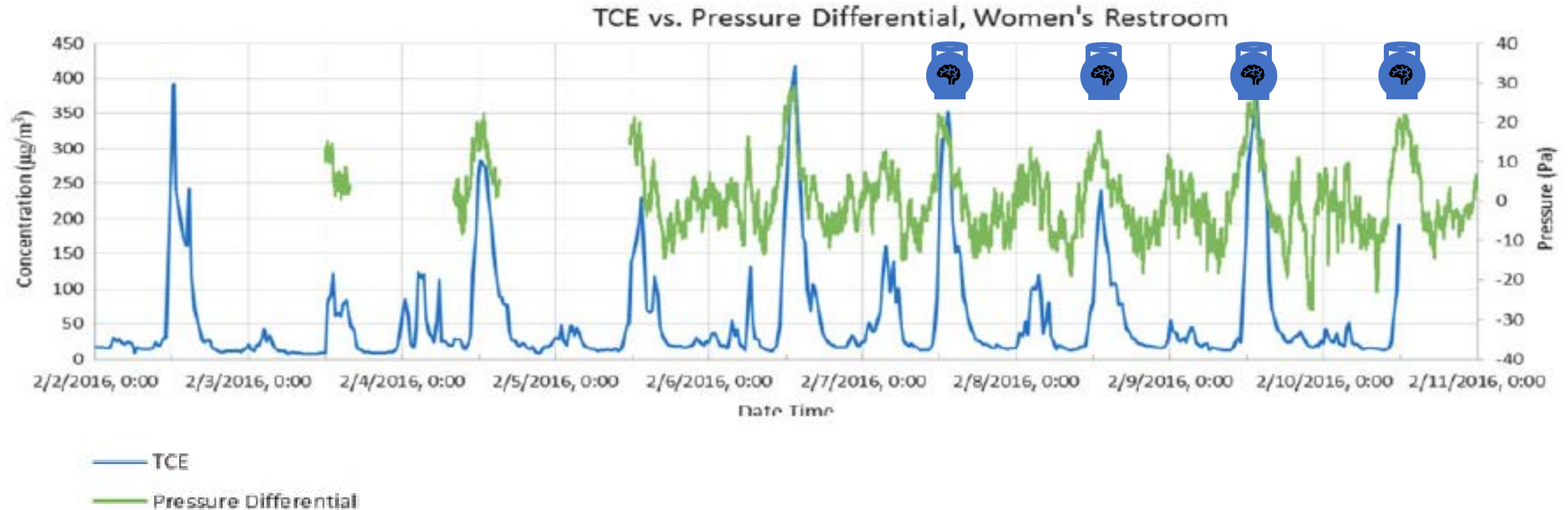


(1) NA, (2) www.restek.com, (3) www.entechinst.com, (4) www.sgsqalson.com

Triggered-Sampling Systems, *example*

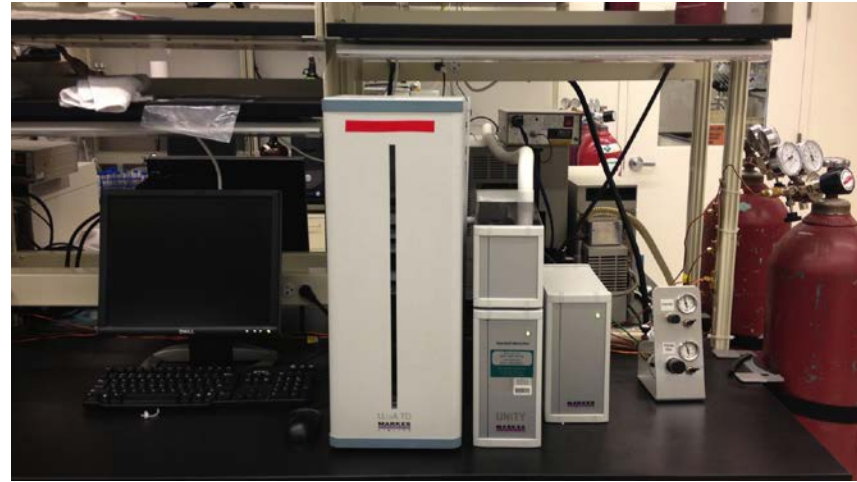


Triggered-Sampling Systems, *example*



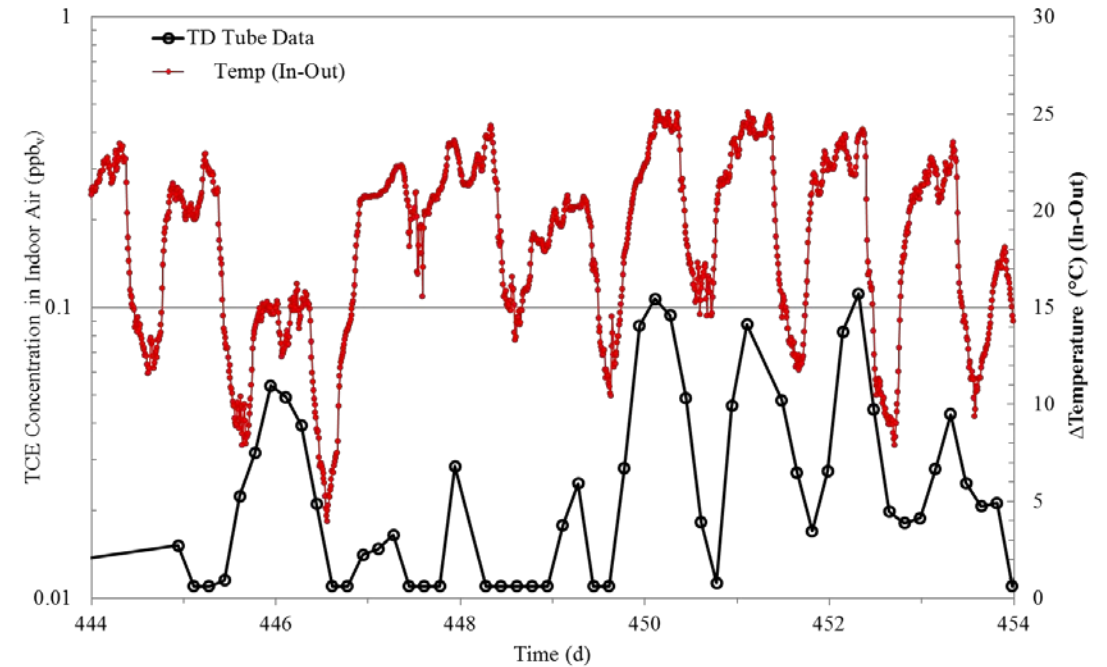
Considerations for ITS Data Collection

- Data sources, equipment used (make, model, date of calibration)
- Accuracy, precision, sensitivity, range, and resolution
- Instrument durability, response time, robustness to loss of power, portability



Considerations for ITS Data Collection

- Collection time and frequency – easier to manage data sets with similar collection times and frequencies
 - When data collection frequency is different (e.g., 24-h vs. 10-min data), easiest to compare using common frequency or period (e.g., 24-h).
 - Direct comparison of data with time may also be beneficial



Summary

- Numerous instruments available for ITS data collection
 - Provide line(s) of evidence for consideration in VI assessment
 - Important to understand instrument application, purpose, capabilities, and limitations
- Triggered- or event-initiated sampling appears promising for improving conventional sampling approaches, more study needed

Resources

- Schuver, H. J. et al., 2018. Chlorinated VI ITS, Part 1 [\(link\)](#)
- EPA Vapor Intrusion Resources [\(link\)](#)
- Indoor Air Vapor Intrusion Database, Workshops and Conferences [\(link\)](#)
- SERDP/ESTCP Vapor Intrusion Resources [\(link\)](#)
- NAVFAC EXWC, Vapor Intrusion Resources [\(link\)](#)
 - Fact Sheet; Use of Tracers, Surrogates, and Indicator Parameters in Vapor Intrusion Assessment [\(link\)](#)
 - Fact Sheet; Real-Time Monitoring for Vapor Intrusion Assessment [\(link\)](#)

Questions?

Thank you,

Chase Holton, Ph.D., P.E.(CO)

CHolton@Geosyntec.com, www.Geosyntec.com/VI

Geosyntec 
consultants