



Mitigating a Phantom Source: Where Are These Vapors Coming From?

Matthew Ambrusch, PE, MBA
Langan Engineering

Flight Plan

- Background
- Development Considerations
- Investigation
- Mitigation Design
- Risk Modeling
- Mitigation Strategy
- Conclusions



Background

- International Airport
- Terminal Construction
- Vapor Investigation Completed
- Elevated Chlorinated Vapor Concentrations Detected

What (and where) is the source?!

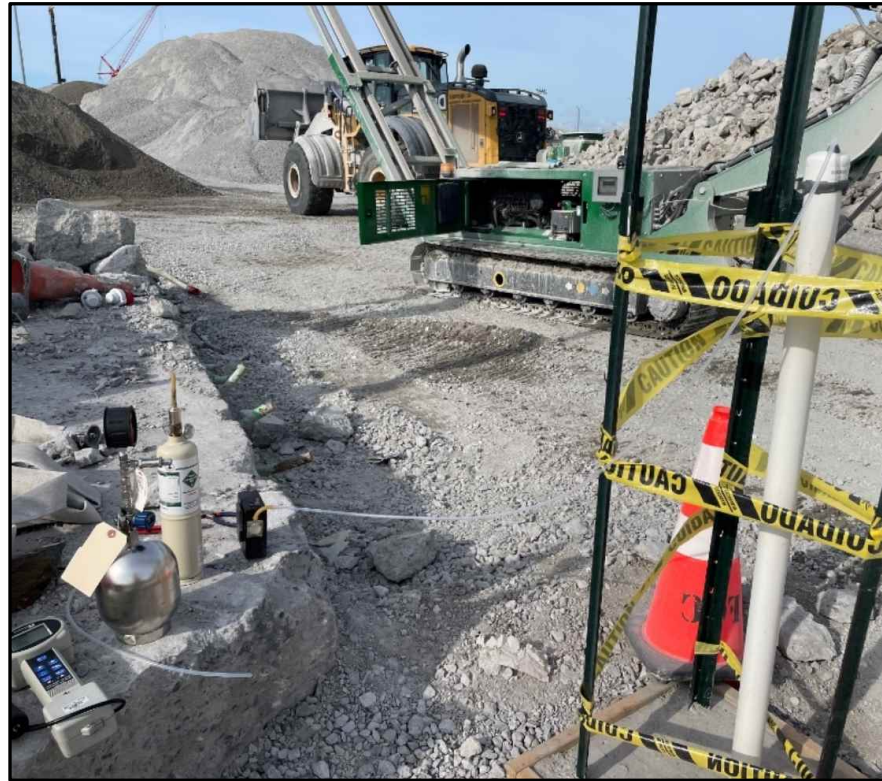
Development Considerations

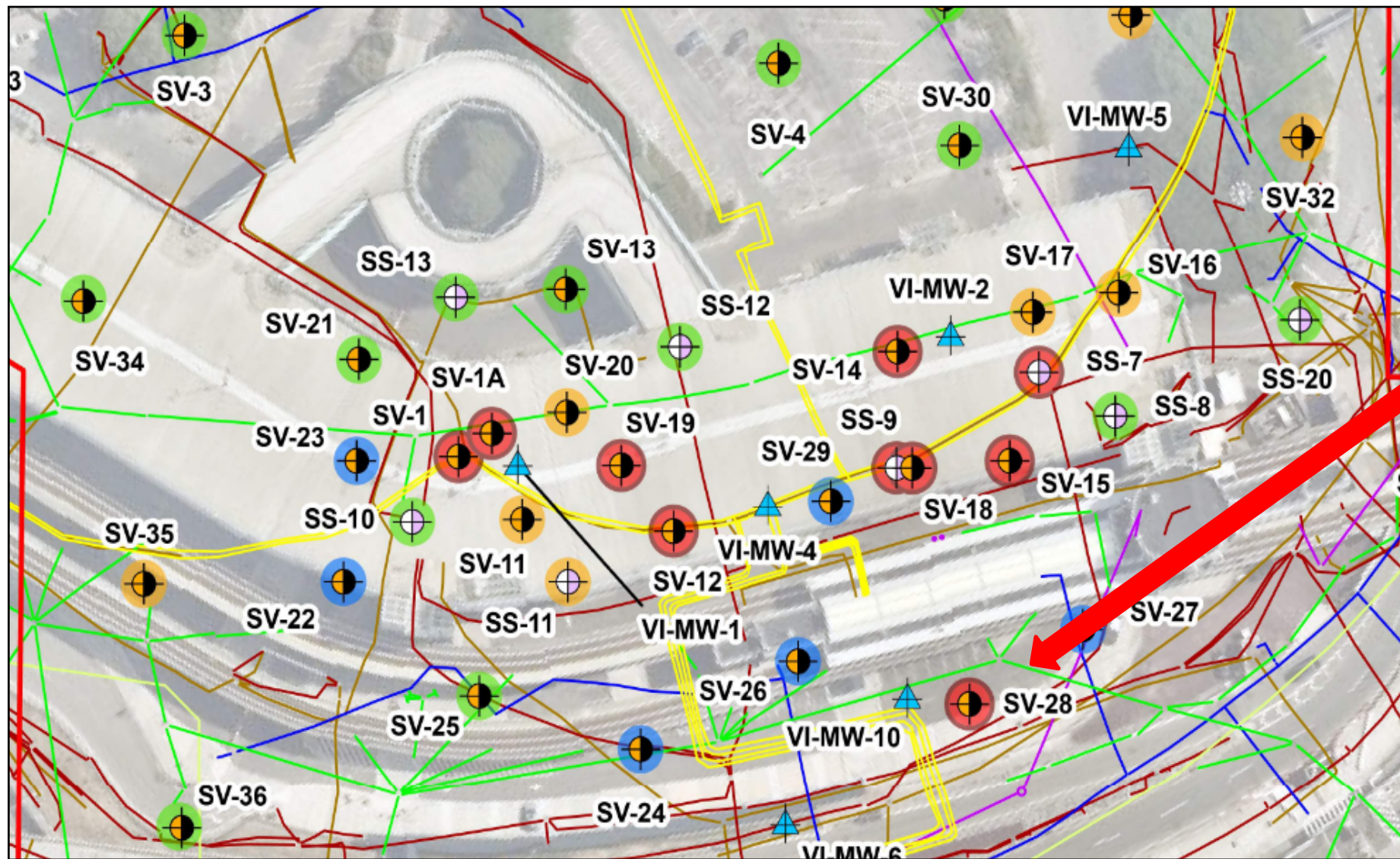
- TIME!!
- Trade Coordination
- Existing and Proposed Utilities
- Building Use – Exposure
- Constructability



Investigation

- Sampling during active demolition and construction
 - 20 sub-slab samples
 - 150 soil vapor samples
 - 5 groundwater samples
 - 16 soil samples

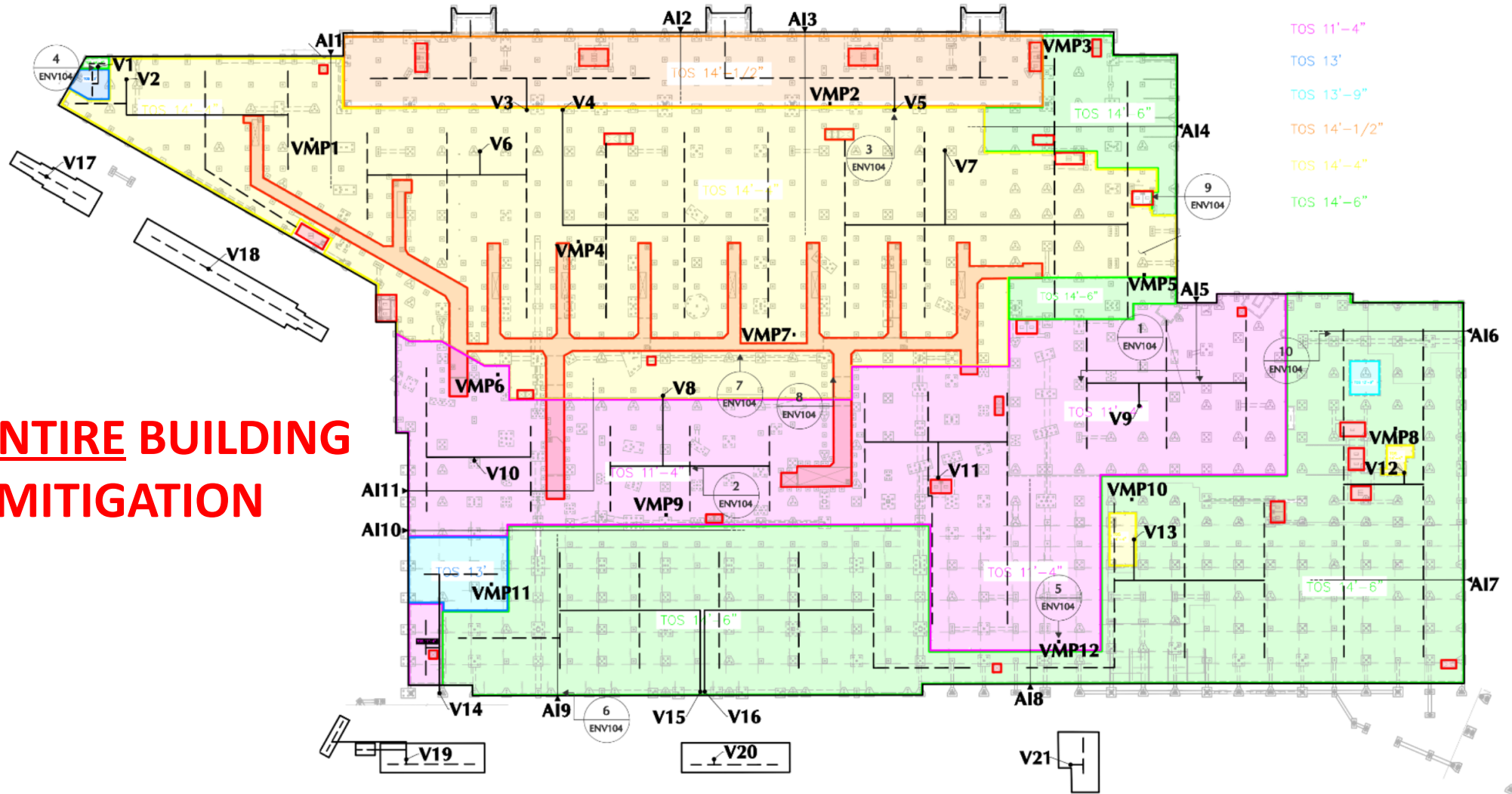




400,000 $\mu\text{g}/\text{m}^3$
of DCE?!

Mitigation Design

**ASSUME THE ENTIRE BUILDING
REQUIRES MITIGATION**



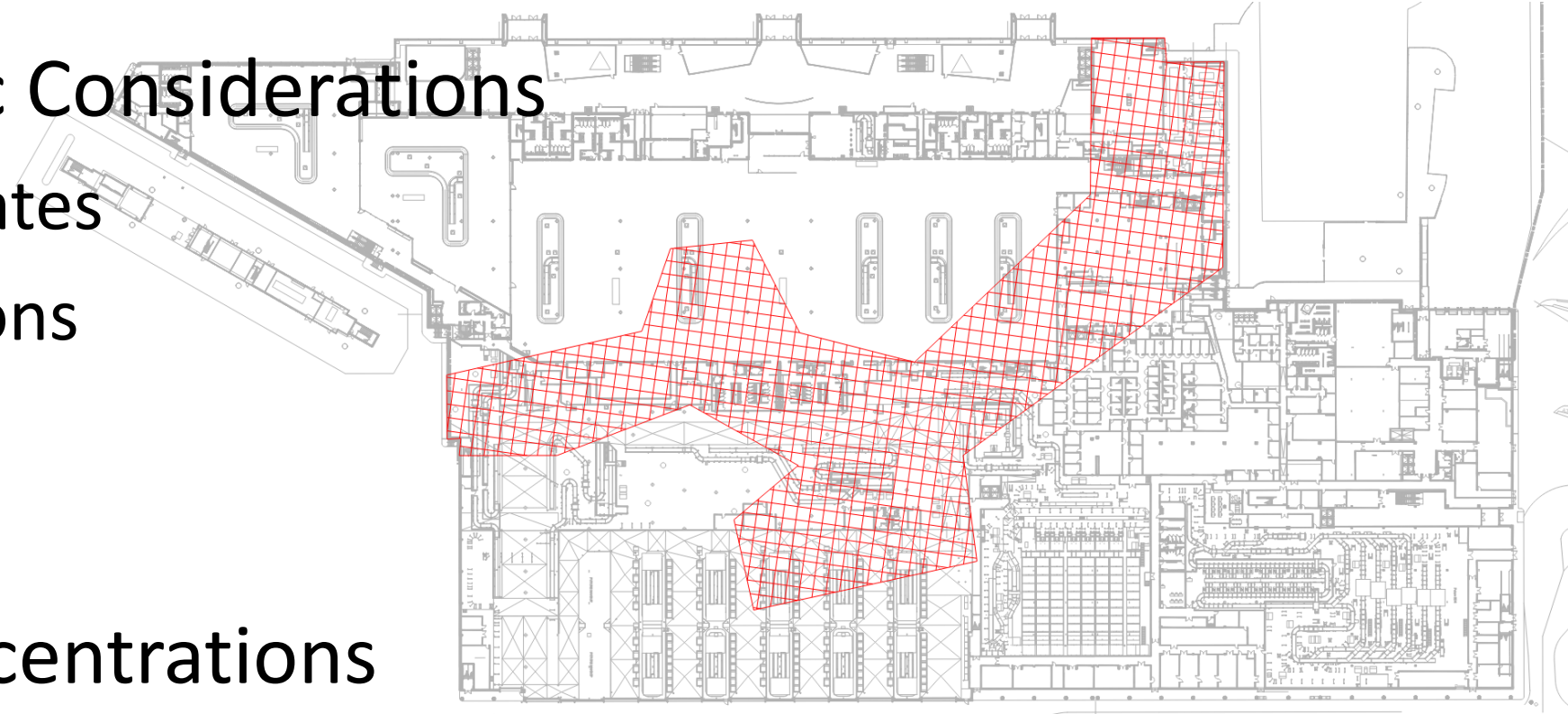
Risk Modeling

		Original Sampling			June Sampling			July Sampling		
SAMPLE ID:	Units	SV-28			SV-43			SV-62		
LAB ID:		L2271205-02			L2267760-04			L2267760-04		
COLLECTION Date:		12/16/2022			6/12/2023			6/12/2023		
SAMPLE MATRIX:		SOIL_VAPOR			SOIL_VAPOR			SOIL_VAPOR		
Volatile Organics in Air		Conc	Q	RL	Conc	Q	RL	Conc	Q	RL
Trichloroethene	ug/m3	ND		134	4.65		1.9	ND		3.79
cis-1,2-Dichloroethene	ug/m3	ND		99.1	ND		1.4	ND		2.8
1,1-Dichloroethene	ug/m3	424000		991	4640		14	2960		2.8
Carbon tetrachloride	ug/m3	ND		157	ND		2.23	ND		4.44
Tetrachloroethene	ug/m3	ND		170	4.2		2.4	33.3		4.79
1,1,1-Trichloroethane	ug/m3	5460		136	917		1.93	5190		3.85
Methylene chloride	ug/m3	ND		2170	ND		30.7	ND		61.1
Vinyl chloride	ug/m3	585		63.9	ND		0.905	ND		1.8

Utility Removal/Abandonment = Concentration Reduction

Risk Modeling

- J&E Modeling
- Building-Specific Considerations
 - Air Exchange Rates
 - Room Dimensions
 - Slab Thickness
 - Waterproofing
- Estimate IA Concentrations



Mitigation Strategy

- Preprufe Waterproofing
 - ✓ Constructable
 - ✓ Contaminant Resistant
 - ✓ Coordinated w/ GC
 - ✓ Appropriate for Building Use
 - ✓ Considers Current (and Future) Vapor Concentrations



Conclusions

- Typical Vapor Contaminants and Sources **NOT** Present
- Coordinated Supplemental Investigations w/ Construction
- J&E Modeling **a Component** of Overall Evaluation
- Integrated Solution

Thank You!

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Matthew Ambrusch, PE, MBA
Associate Principal

LANGAN | Parsippany, NJ

Direct: 973.560.4282

Email: mambrusch@langan.com

www.langan.com