



MDEQ

MI OSHA

GPS

U.S. EPA

PEL

E 2600-08

AIAC

VI

OM4-A4

ASGSC

TO-15 or TO-17

ASTM

GVIIC

CSM

JEM

SVIIC

1





Vapor Intrusion

Presented by Gary Klepper
Conestoga-Rovers & Associates Inc.

November 5, 2008, East Lansing, Michigan

Presented at:
the Environmental Law Section of the Michigan State Bar Association
and East and West Michigan Chapters of the Air and Waste Management
Association Chapters Joint Conference on
“Managing Environmental and Regulatory Change”





Two circumstances that may require addressing VI:

- Hazardous substances in soil/groundwater at a property
- Prospective real estate transaction





MDEQ

MI OSHA

GPS

U.S. EPA

PEL

E 2600-08

AIAC



OM4-A4

ASGSC

TO-15 or TO-17

ASTM

GVIIC

CSM

JEM

SVIIC





Relevant Standards of Practice

- USEPA Method TO-15 (1999)
- USEPA Draft Guidance (USEPA530-F-002, 2002)





MDEQ

MI OSHA

GPS

U.S. EPA

PEL

E 2600-08

AIAC



OM4-A4

ASGSC

TO-15 or TO-17

ASTM

GVIIC

CSM

JEM

SVIIC





Draft MDEQ Guidance for Evaluation of VI for hazardous substances in soil and / or groundwater

7



CRAWORLD.COM

Worldwide Engineering, Environmental, Construction, and IT Services



- General Obligation
- Benchmarks/ Reference Values
- Technical Approach and "SOPs"
- "Required" vs. "Recommended" or Suggested Actions





For Soil or GW > Generic Criteria,
Risks of VI MUST be evaluated

9



CRAWORLD.COM

Worldwide Engineering, Environmental, Construction, and IT Services



MDEQ

MI OSHA

GPS

U.S. EPA

PEL

E 2600-08

AIAC



OM4-A4

ASGSC

TO-15 or TO-17

ASTM

GVIIC

CSM

JEM

SVIIC





Illustration of Vapor Phase Reference Values

Trichloroethylene in parts per billion by volume

	AIAC	PEL (TWA)	ASGSC SubSlab	ASGSC Deep
Residential	2.6	—	130	1,300
(SVIIC=7,100*)	—			
(GWVIIC=15,000*)	—			
Industrial / Commercial	11	50,000	540	5,400
(SVIIC=37,000*)	—			
(GWVIIC=97,000*)	—			

11

* = ppb by mass





Acceptable Strategies for VI Evaluation

Purpose	Initial Assessment	Interim Response Decisions	Due Care	Remedial Decisions
Evaluation				
Indoor Air Sampling	NA	Yes	Yes (a), (b)	NA
Soil Gas Sampling	Generally NA	Yes	Yes (a), (c)	Generally NA
Groundwater Sampling	Yes	Yes	Yes	Yes
Soil Sampling	Yes	Yes	Yes	Yes



“Must” vs. “Should” Actions

13





ASTM Standard for Assessment of VI in Property Transactions

14



CRAWORLD.COM

Worldwide Engineering, Environmental, Construction, and IT Services



- Can be combined with a Phase I ESA
- Identifies presence or likely presence of "VIC"
- Tiered Screening Approach





Tier 1 – Non-invasive screening

Tier 2 – Refined screening:
data collection if not available

Tier 3 – Detailed assessment (new data)

Tier 4 – Mitigation analysis for VICs and
pVICs



MDEQ

MI OSHA

GPS

U.S. EPA

PEL

E 2600-08

AIAC

VI

OM4-A4

ASGSC

TO-15 or TO-17

ASTM

GVIIC

CSM

JEM

SVIIC

17

