

Technical Guidance 4: Vapour Investigation and Remediation

Stakeholder Workshop

Fort St. John – May 20 & 21, 2009

Colm Condon
Colm.Condon@gov.bc.ca

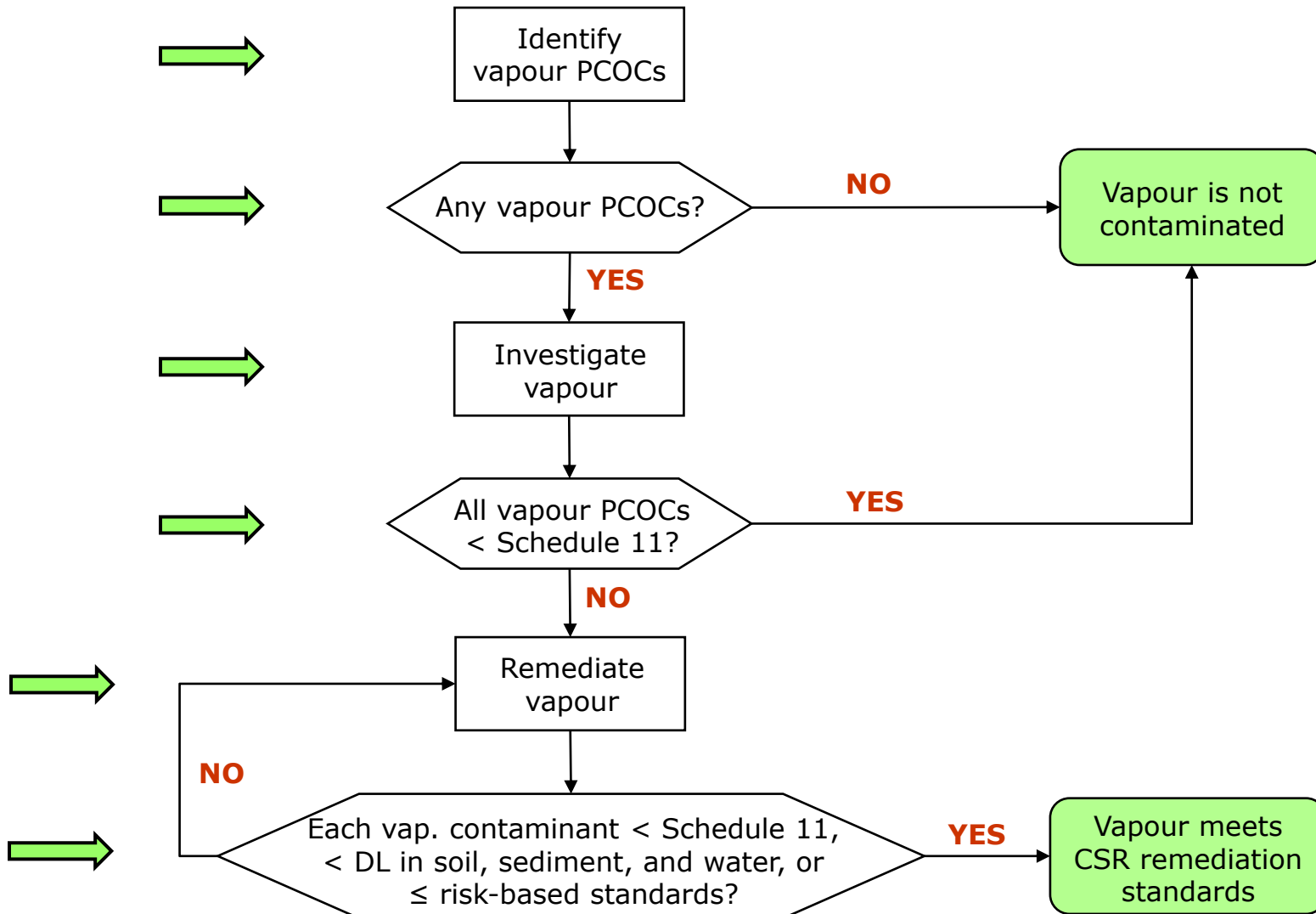
Presentation Overview

2009-05-25

- Technical Guidance 4 overview
- Technical Guidance 4 details
- Grandfathering
- Final comments

Technical Guidance 4 Overview

2009-05-25



Identify Vapour PCOCs

2009-05-25

Vapour PCOC characteristics:

Schedule 2

Schedule 2 [am. B.C. Regs. 17/2002, s. 16; 239/2007, s. 5; 343/2008, s. 12.] Industrial and Commercial Purposes and Activities	
COLUMN I Item	COLUMN II Purpose or Activity
A	Chemical industries and activities
B	Electrical equipment and activities
C	Metal smelting, processing or finishing industries and activities
D	Mining, milling or related industries and activities
E	Miscellaneous industries, operations or activities
F	Petroleum and natural gas drilling, production, processing, retailing, distribution and storage other than the storage of residential heating fuel in tanks
G	Transportation industries, operations and related activities
H	Waste disposal and recycling operations and activities
I	Wood, pulp and paper products and related industries and activities

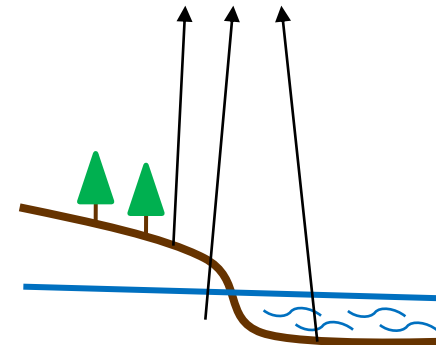
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Schedule 11

Schedule 11 [en. B.C. Reg. 343/2008, s. 20.] Generic Numerical Vapour Standards ^{1,2,3,4}				
COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V
Substance	Chemical Abstract Service Number (CAS)	Agricultural, Urban Park, Residential Use Standard ¹	Commercial Use Standard ²	Industrial Use Standard ³
acetaldehyde	75-07-0	4.5	15	40
acetone	67-64-1	20	60	200
acetone cyanohydrin	75-86-5	60	200	550
acetonitrile	75-05-8	60	200	550
acrolein (2-propenal) ⁴	107-02-8	2	2	2
acrylonitrile (2-propenenitrile) ⁴	107-13-1	1.5	1.5	1.5
allyl chloride (3-chloropropene)	107-05-1	1	3	9
ammonia	7664-41-7	100	300	900
BODM (bromodichloromethane) ⁵	75-27-4	1	2	6.5
benzene	71-43-2	1.5	4	10
benzotrichloride (p,a,a-trichlorotoluene) ⁶	98-07-7	0.2	0.2	0.2
benzyl chloride (α-chlorotoluene)	100-44-7	5	15	45
bis(2-chloroethyl) ether ⁷	111-44-4	2	2	2
bis(2-chloroisopropyl) ether	39638-32-9	80	250	700
bis(2-chloromethyl) ether ⁸	542-88-1	1	1	1
bis(2-chloro-1-methylethyl) ether	108-60-1	1	3	9
bromobenzene	108-86-1	10	30	90
bromodichloromethane (BODM) ⁵	75-27-4	1	2	6.5

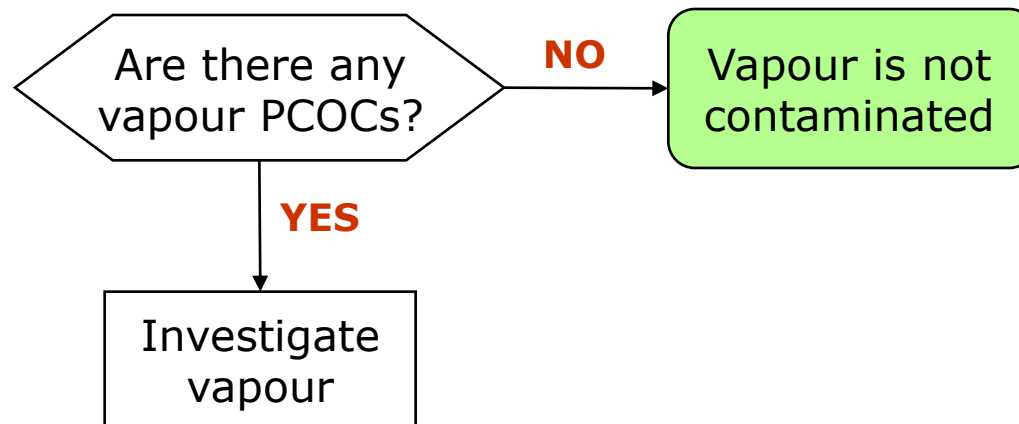
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≥ Detection limit



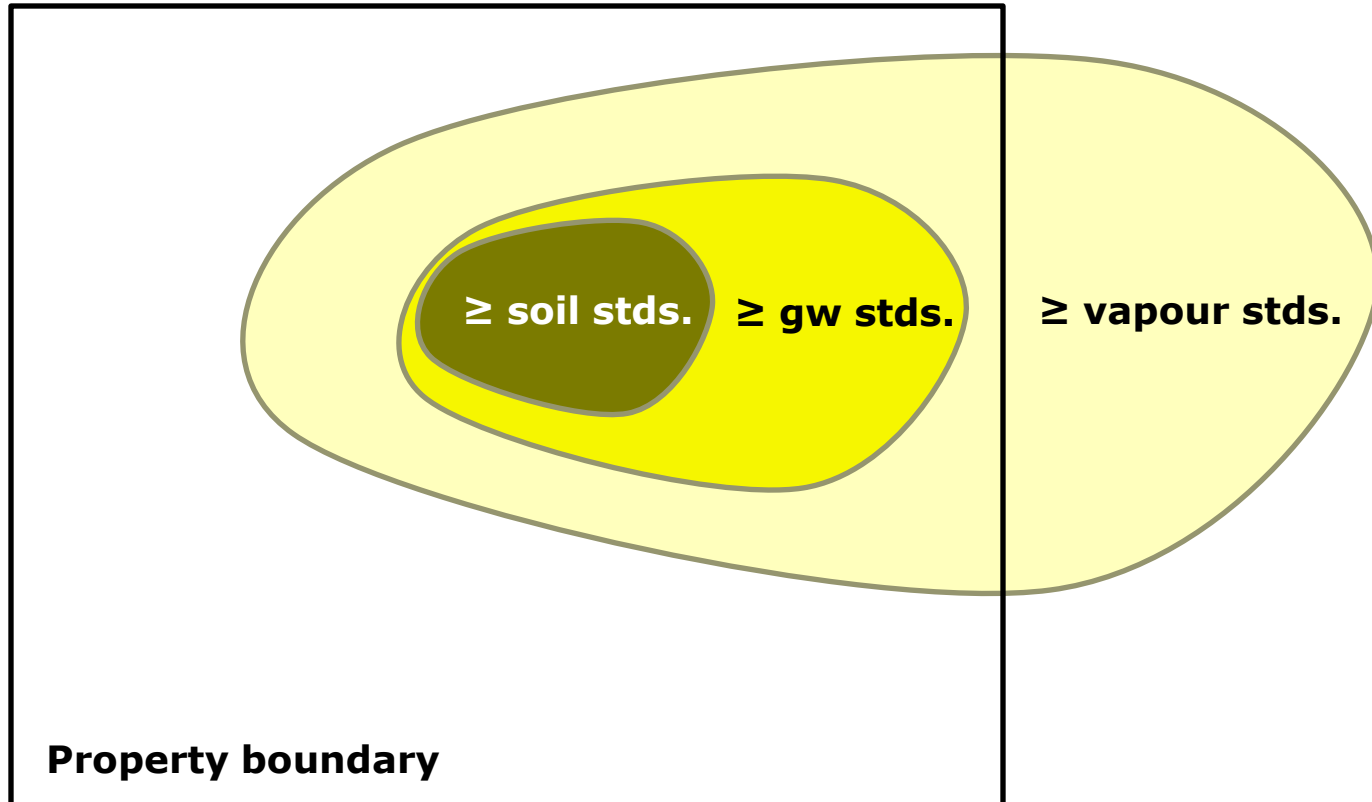
Question 1

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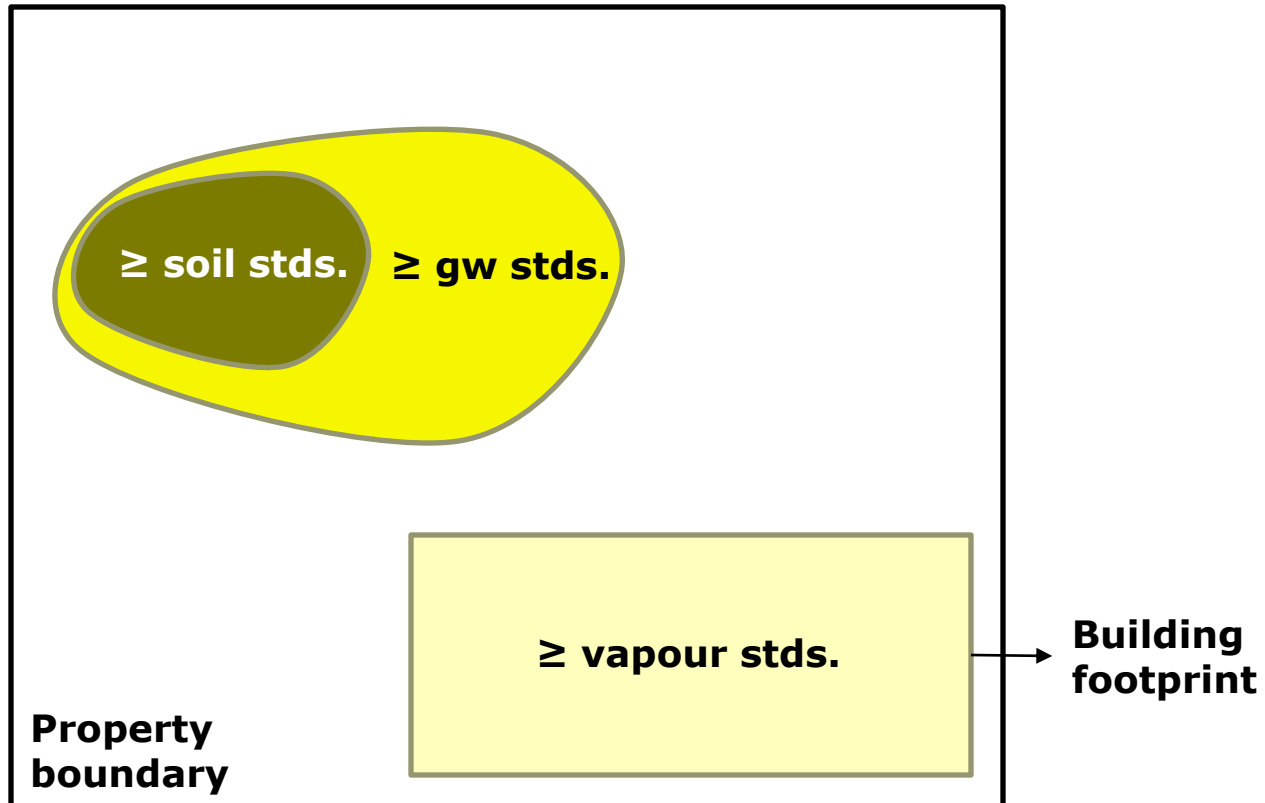
Investigation Objective

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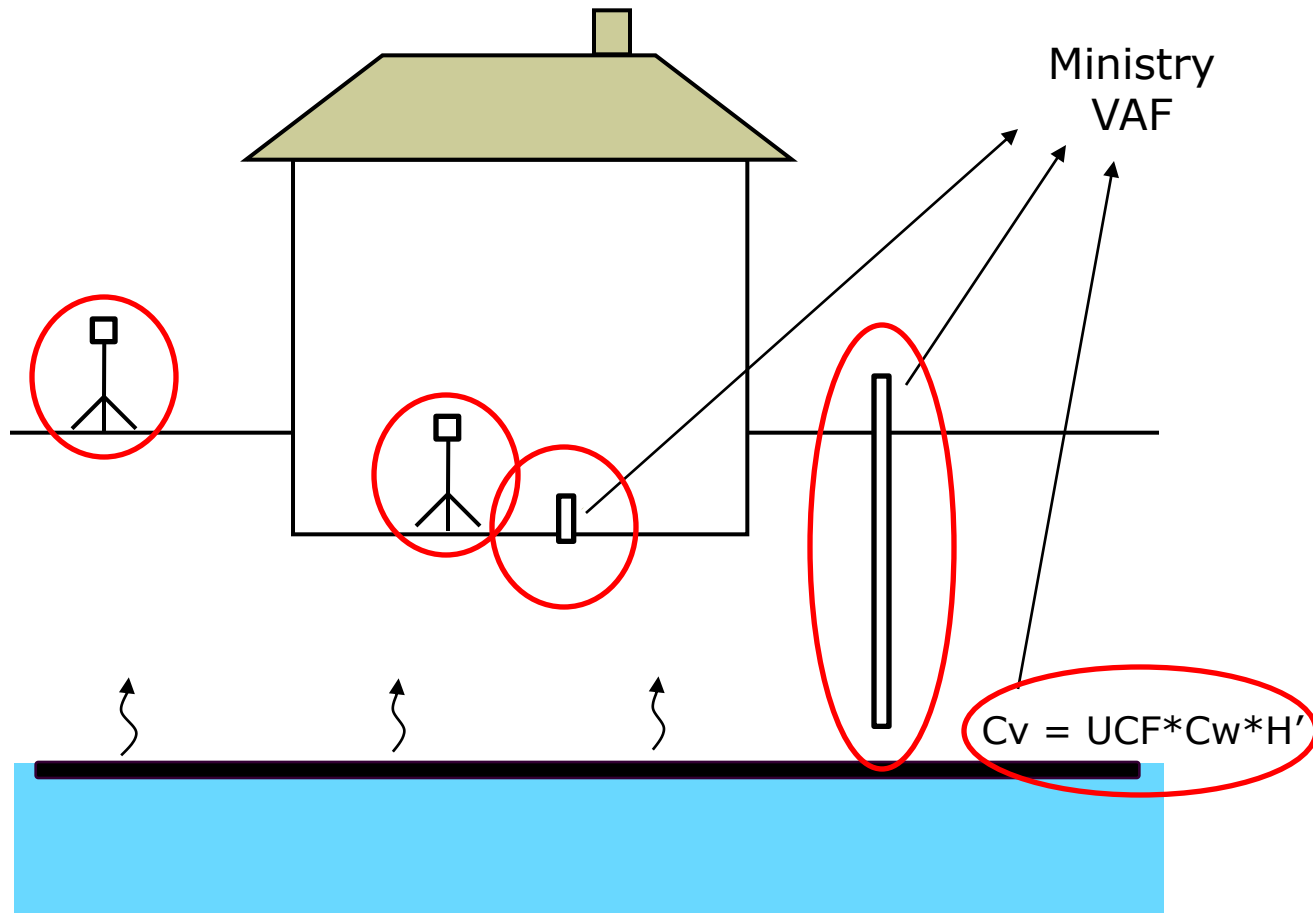
Investigation Objective

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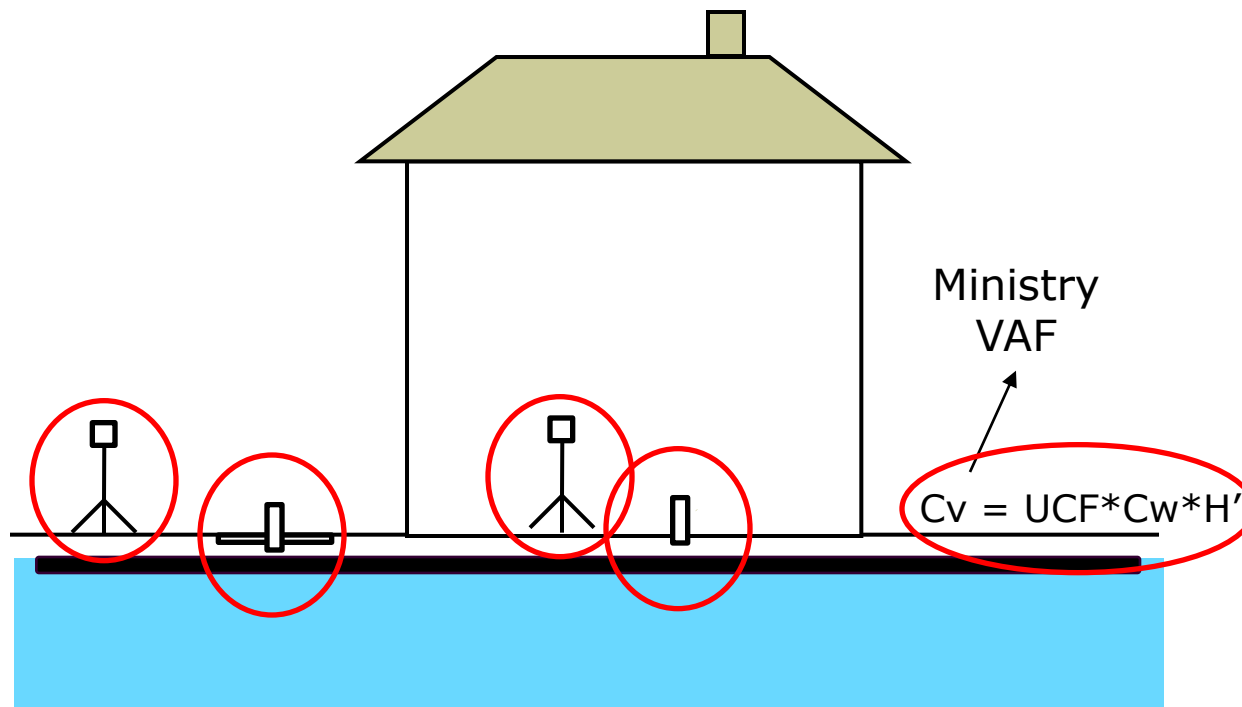
Investigation Options

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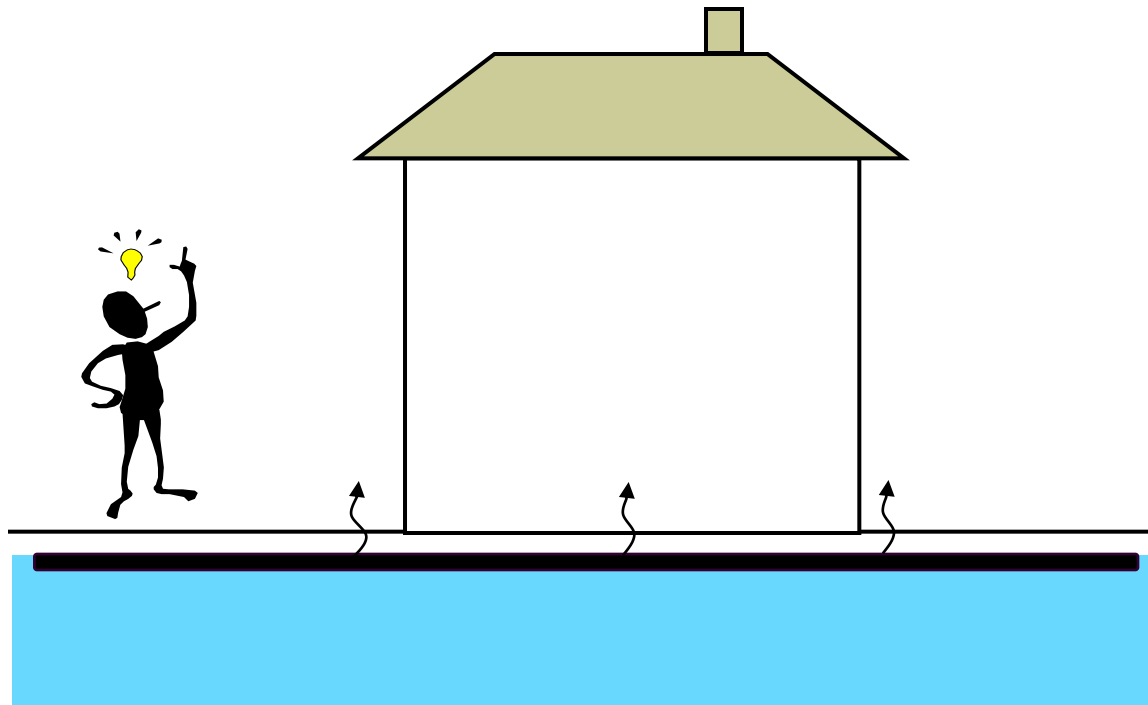
Shallow Source Investigation

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Shallow Source Investigation

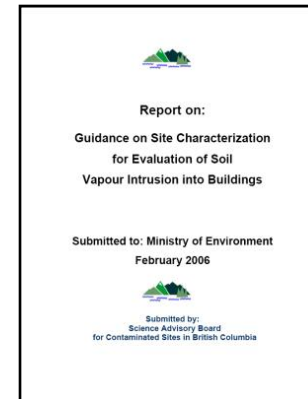
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Modeling



Sampling & analysis



Science
Advisory
Board

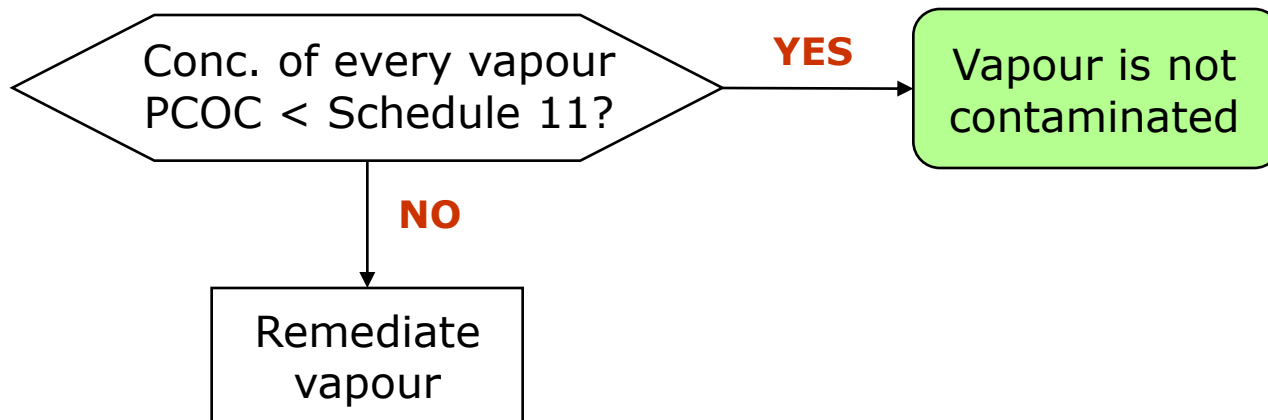
Vapour Attenuation Factors

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Sample Location	Sample Depth ^{2,3}	Vapour Attenuation Factor (α) ¹		
		Outdoor Exposure	Indoor Exposure	
			Agricultural, Urban Park, Residential Use	Commercial/Industrial Use
Subslab ⁴	n/a	n/a	2.0×10^{-2}	
Subsurface	1.0 m	1.5×10^{-5}	2.8×10^{-3}	3.7×10^{-4}
	1.5 m	1.2×10^{-5}	2.3×10^{-3}	3.4×10^{-4}
	2.0 m	9.2×10^{-6}	2.0×10^{-3}	3.1×10^{-4}
	3.0 m	6.1×10^{-6}	1.6×10^{-3}	2.7×10^{-4}
	5.0 m	3.7×10^{-6}	1.1×10^{-3}	2.1×10^{-4}
	7.0 m	2.6×10^{-6}	8.3×10^{-4}	1.7×10^{-4}
	10.0 m	1.8×10^{-6}	6.2×10^{-4}	1.3×10^{-4}
	15.0 m	1.2×10^{-6}	4.3×10^{-4}	9.9×10^{-5}
	20.0 m	9.2×10^{-7}	3.3×10^{-4}	7.8×10^{-5}
	30.0 m	6.1×10^{-7}	2.3×10^{-4}	5.5×10^{-5}

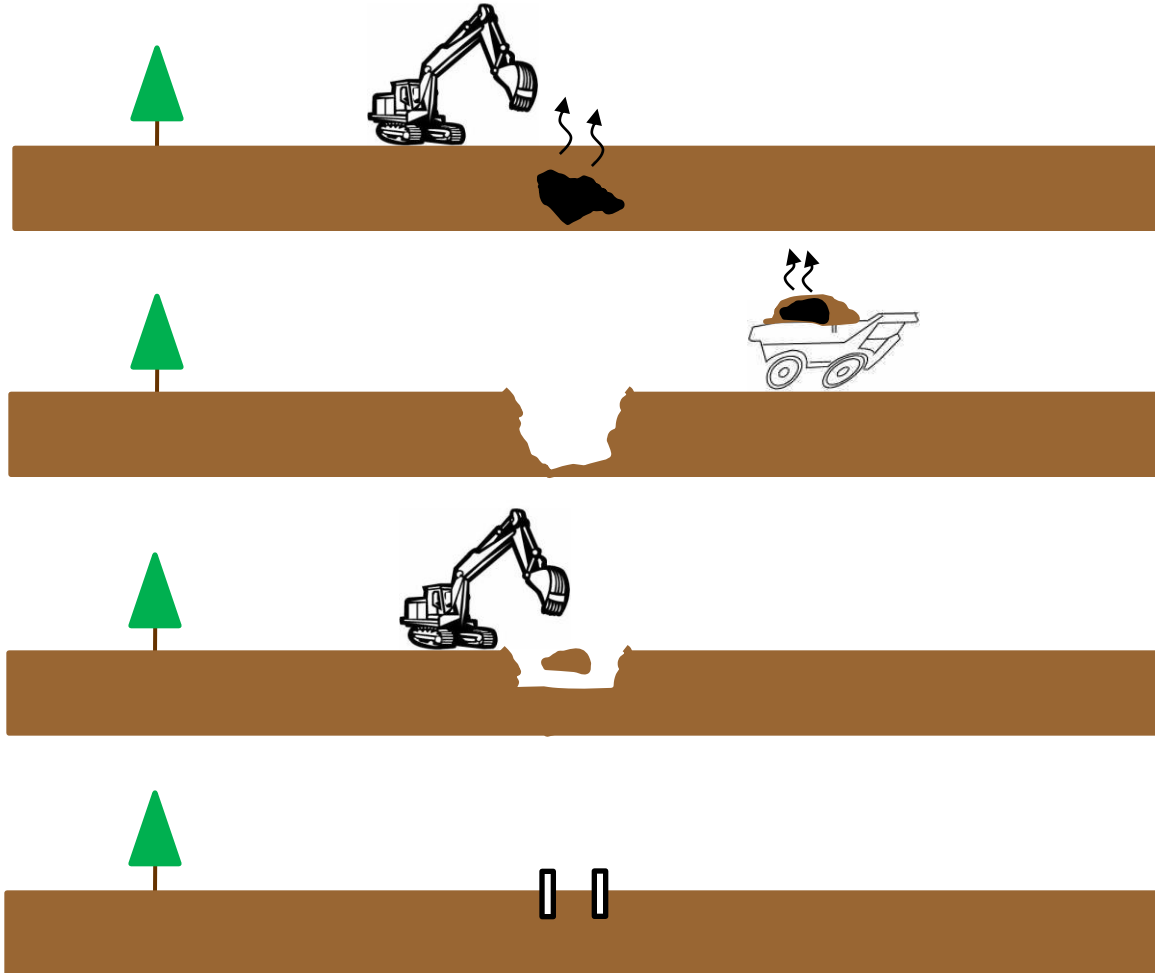
Question 2

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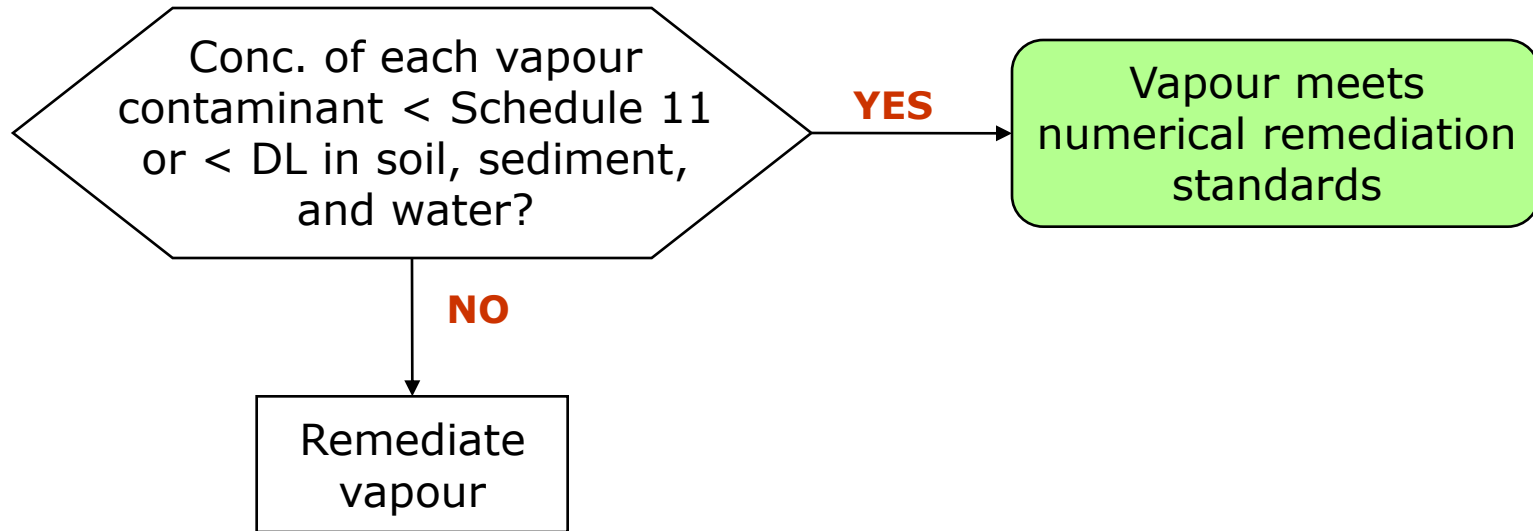
Remediate to Numerical Stds

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Question 3

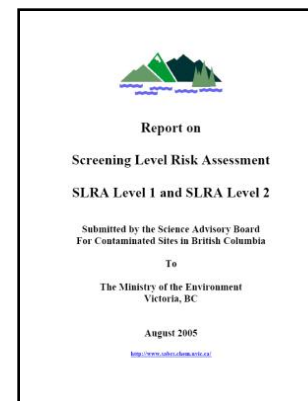
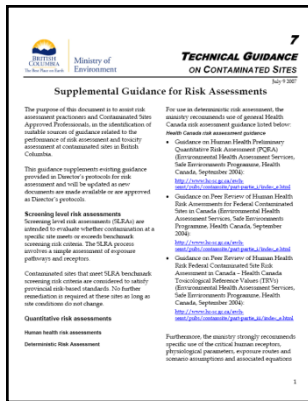
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Vapour Risk Assessment

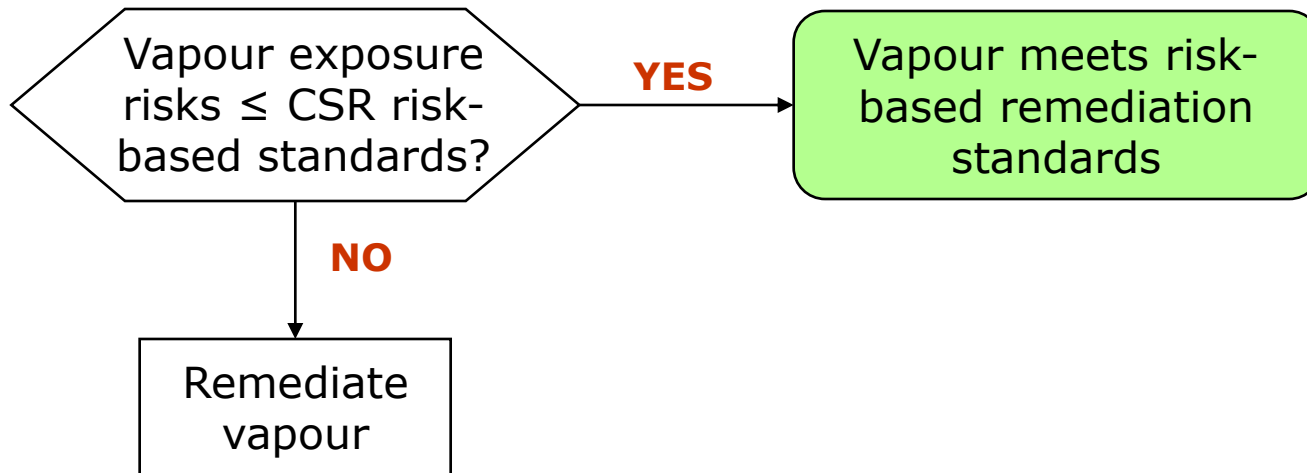
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- Any documented & defensible approach OK
- Literature:



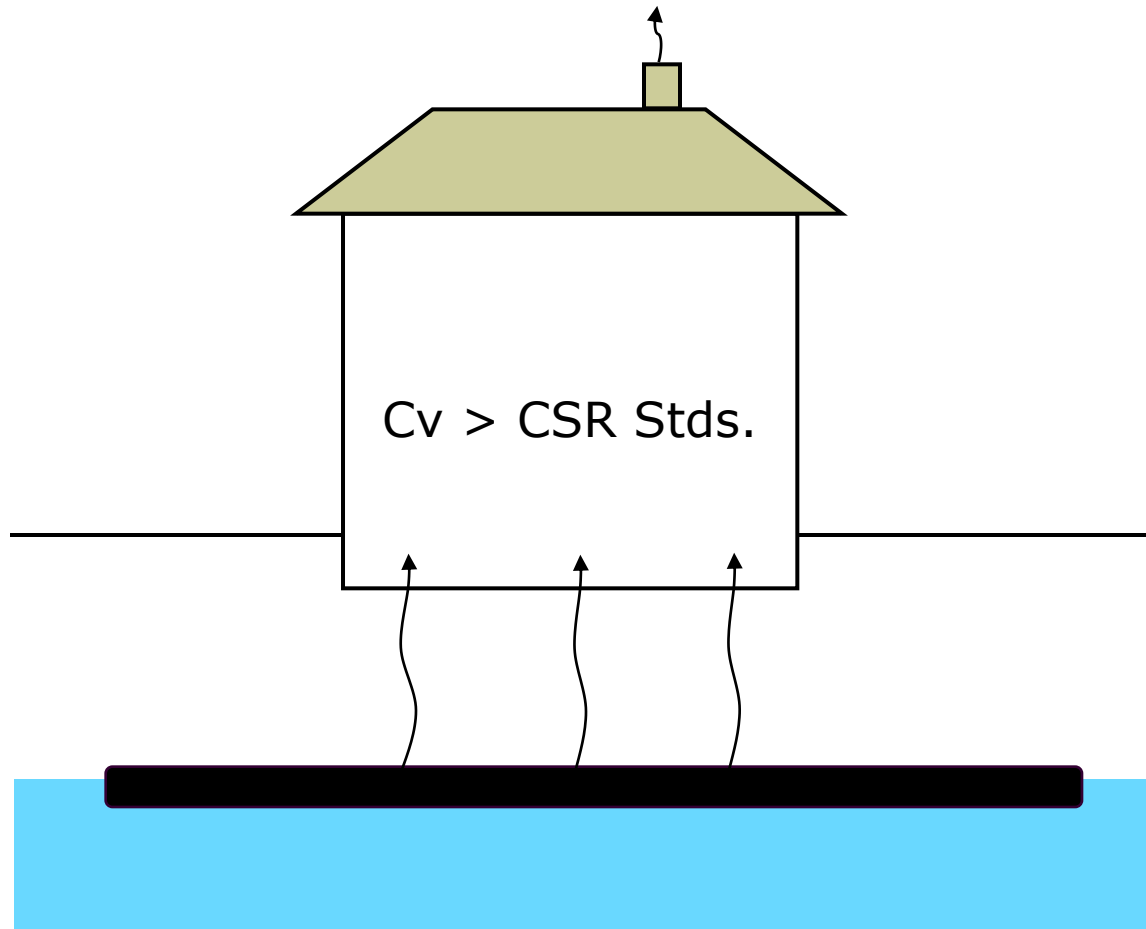
Question 4

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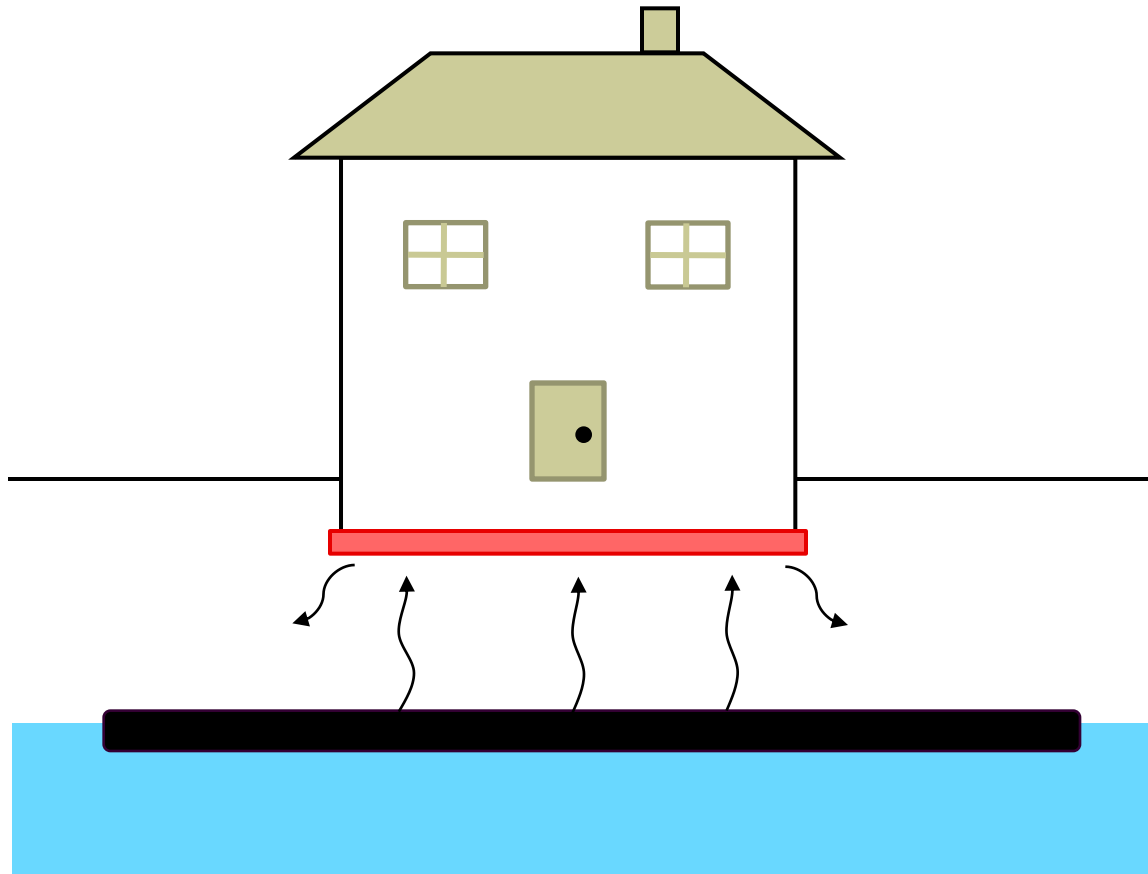
Vapour Management

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Vapour Management

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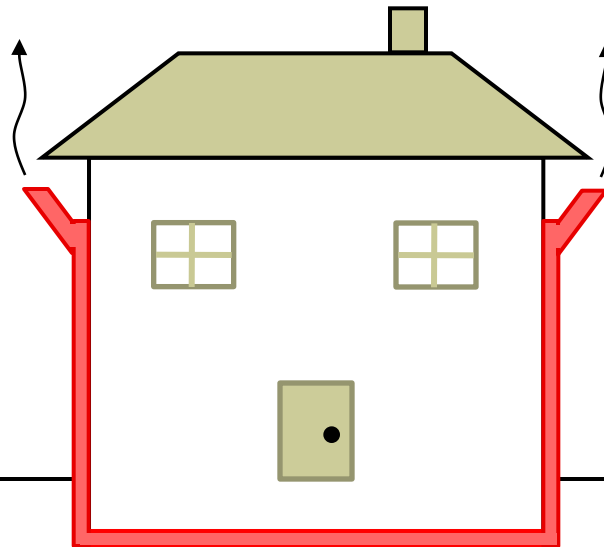
Vapour Management

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Jane Wong

Jane Wong
Professional Engineer

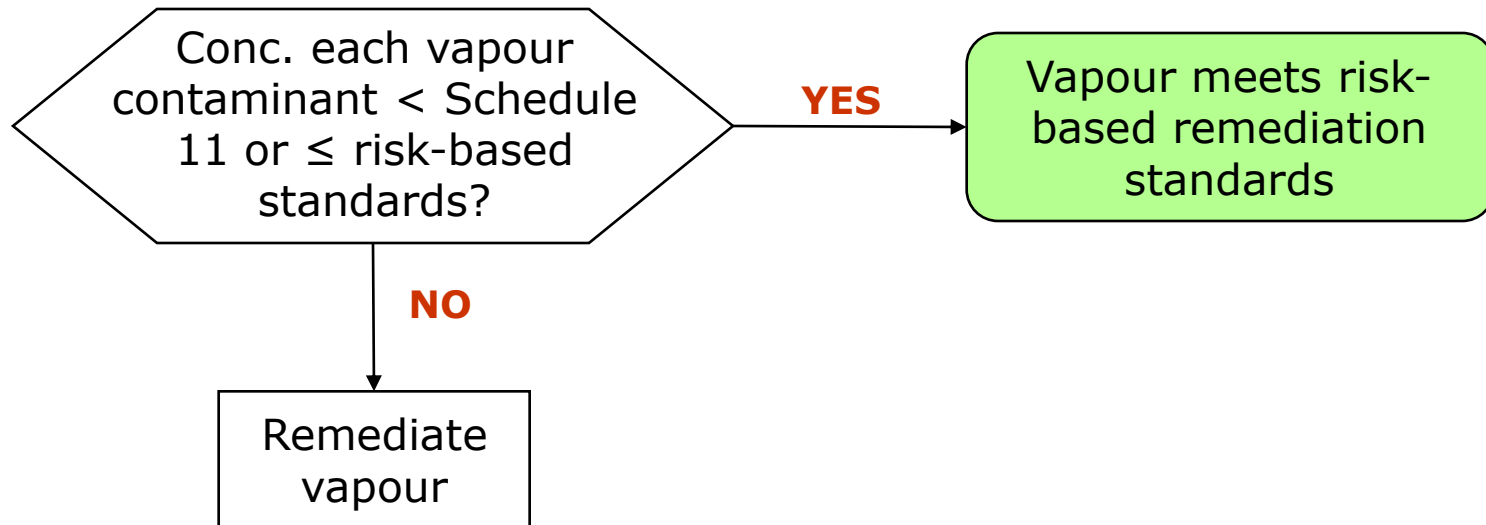


John Doe

John Doe
Approved Professional

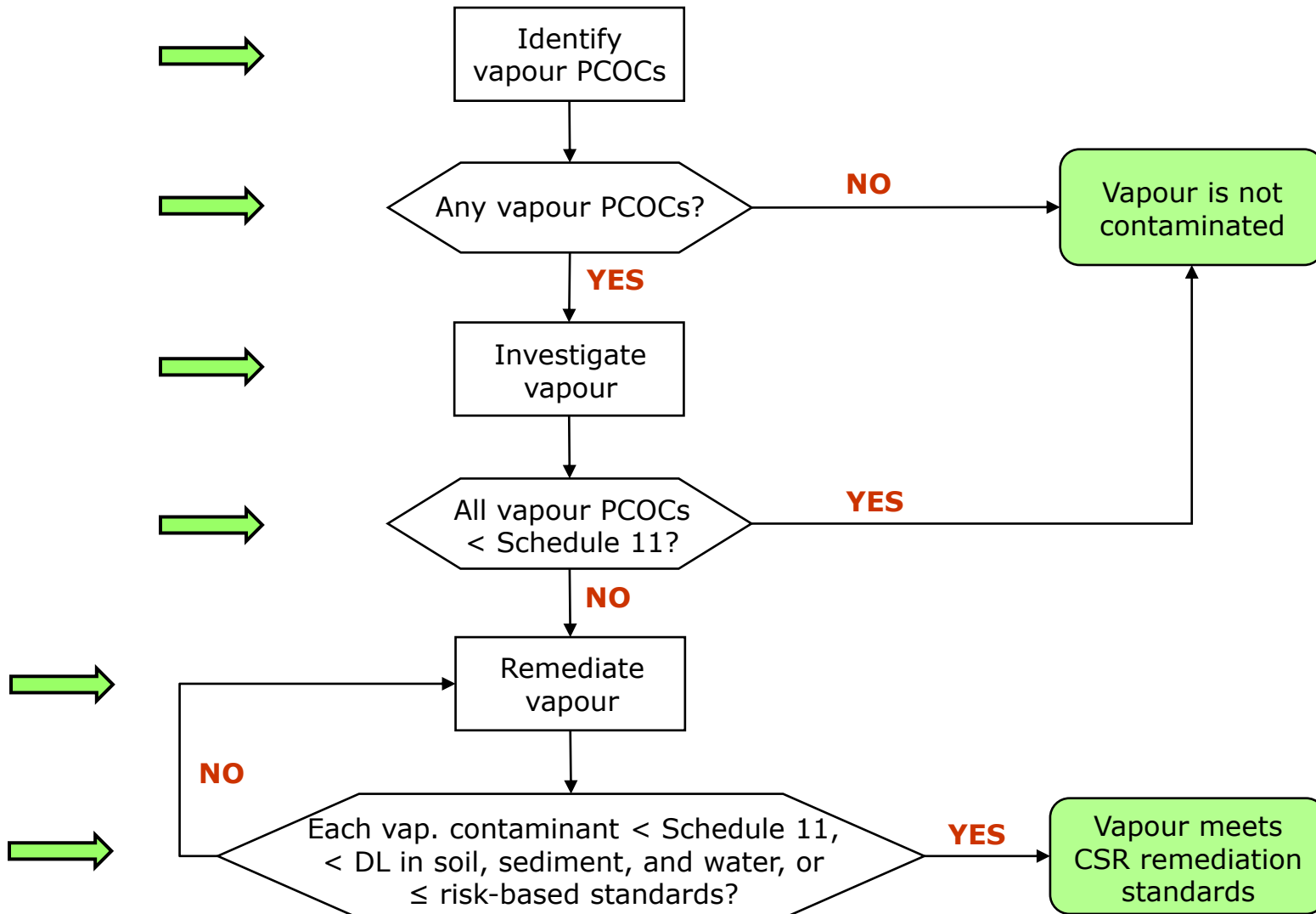
Question 5

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Summary

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No vapour guidance → interim guidance:

- Extended to 30-June-2009

Interim guidance → Technical Guidance 4:

- Up to 30-June-2009: interim guidance (with Schedule 11) or Technical Guidance 4
- After 30-June-2009: Technical Guidance 4

- Draft Technical Guidance 4 posted
- Can use immediately
- Comments in, more welcome
- Send comments to colm.condon@gov.bc.ca