

Technical Guidance 4: Vapour Investigation and Remediation

Annual Stakeholder Workshop
Vancouver – February 16 & 17, 2009

Colm Condon
Colm.Condon@gov.bc.ca

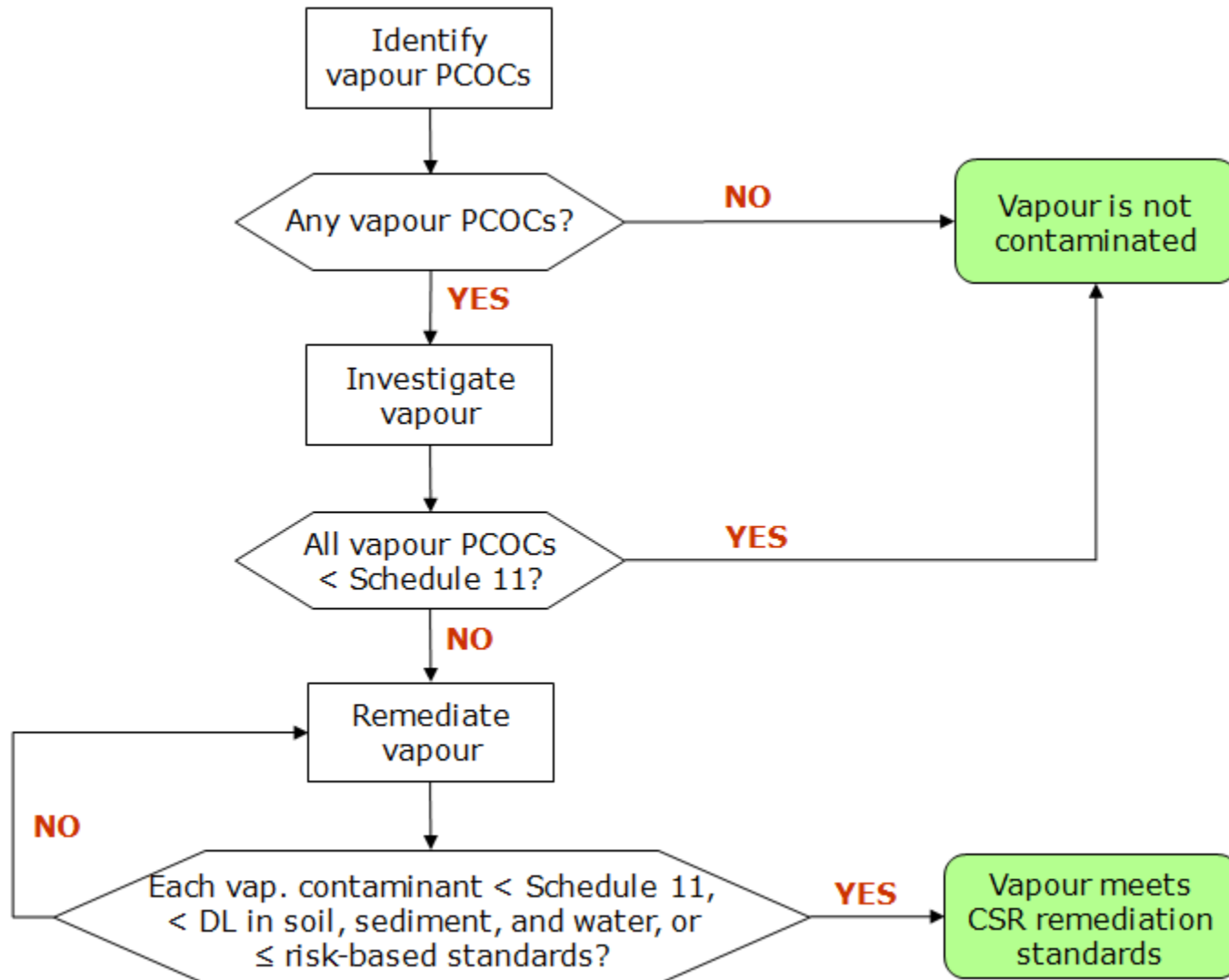
Presentation Overview

2009-04-30

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

Technical Guidance 4 Overview

2009-04-30



Identify Vapour PCOCs

2009-04-30

Vapour PCOC characteristics:

Schedule 2

Schedule 2 [en. R.C. Reg. 12/2002, s. 18; 23/2007, s. 9; 5/2/2008, s. 12.] Industrial and Commercial Purposes and Activities	
Column 1 Item	Column 2 Principal Purpose or Activity
A	Chemical industries and activities
B	Electrical equipment and activities
C	Food handling, processing or finishing industries and activities
D	Mining, milling or related industries and activities
E	Manufacturing industries, operations or activities
F	Manufactures and natural gas filling, production, processing, transport, 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

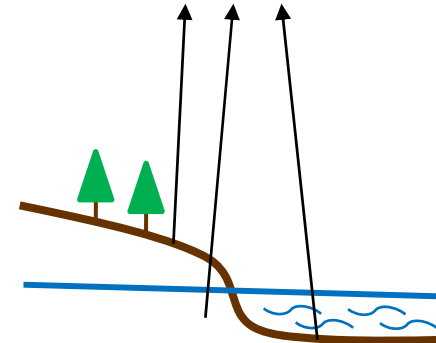
+

Schedule 11

Schedule 11 [en. R.C. Reg. 5/2/2008, s. 28.] Domestic Residential Vapour Characteristics ^{1/14}				
Column 1 Substance	Column 2 Chemical Abstracts Number (CAN) [CAS]	Column 3 Agricultural, Pesticide, Fertiliser, Fungicide, Herbicide, Insecticide ²	Column 4 Commercial Use Character ³	Column 5 Industrial Use Character ⁴
Acetylene gas	75-07-0	4.5	25	40
Acetone	63-06-0	20	100	100
Acetone vapour	75-06-6	80	100	100
Acetylene	75-05-6	80	100	100
Acetylene (2-propanol) ⁵	107-03-4	2	2	2
Acetylene (2-propanol) ⁶	107-03-3	2.5	2.5	2.5
Acetylene (2-chloropropanol) ⁷	107-05-3	2	2	2
Acetylene	75-01-7	100	100	100
Ammonia (aqueous solution) ⁸	77-27-6	2	2	2.5
Ammonia	77-82-3	2.5	4	10
Ammonia (aqueous solution) ⁹	86-87-7	0.2	0.2	0.2
Ammonia (aqueous solution) ¹⁰	100-04-7	5	25	45
Ammonia (aqueous solution) ¹¹	102-44-4	2	2	2
Ammonia (aqueous solution) ¹²	30020-23-0	80	100	100
Ammonia (aqueous solution) ¹³	502-88-3	2	2	2
Ammonia (aqueous solution) ¹⁴	100-00-0	2	2	2
Ammonia (aqueous solution) ¹⁵	100-00-0	20	20	20
Ammonia (aqueous solution) ¹⁶	77-27-6	2	2	2.5

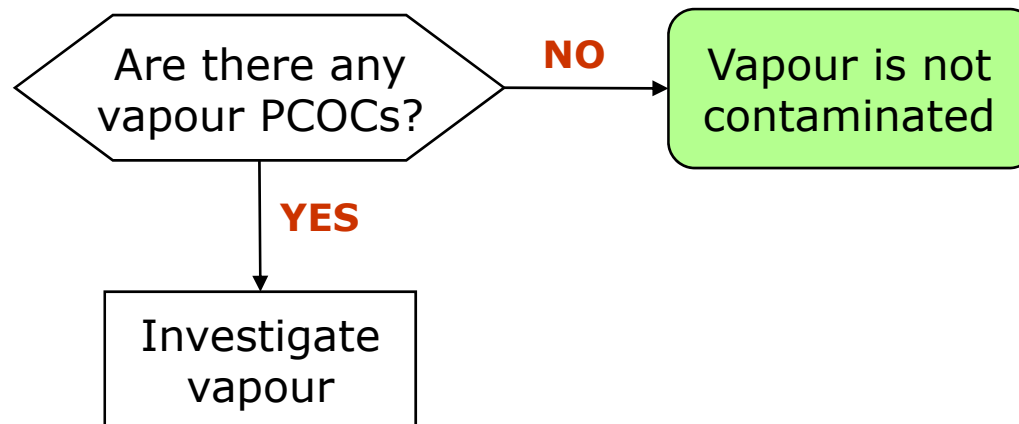
+

≥ Detection limit



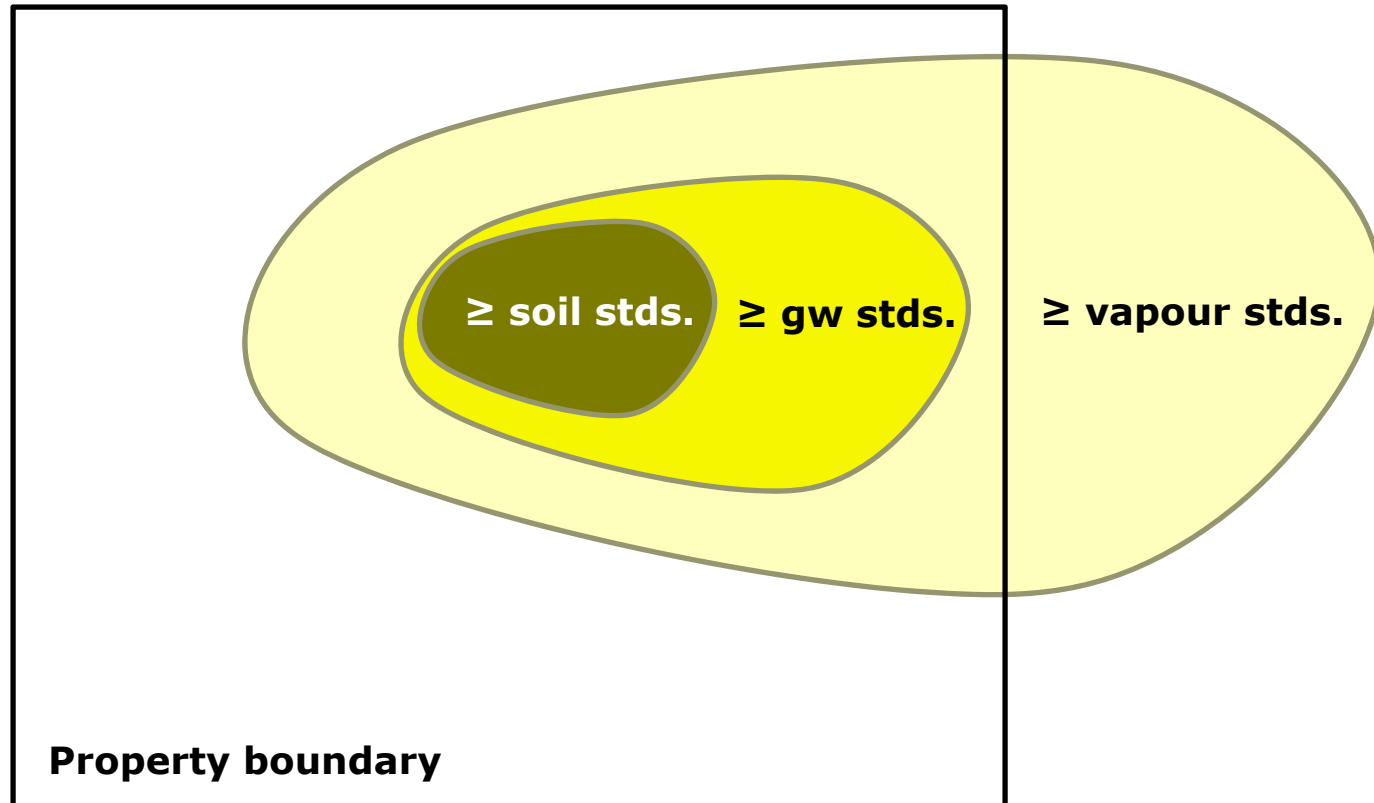
Question 1

2009-04-30



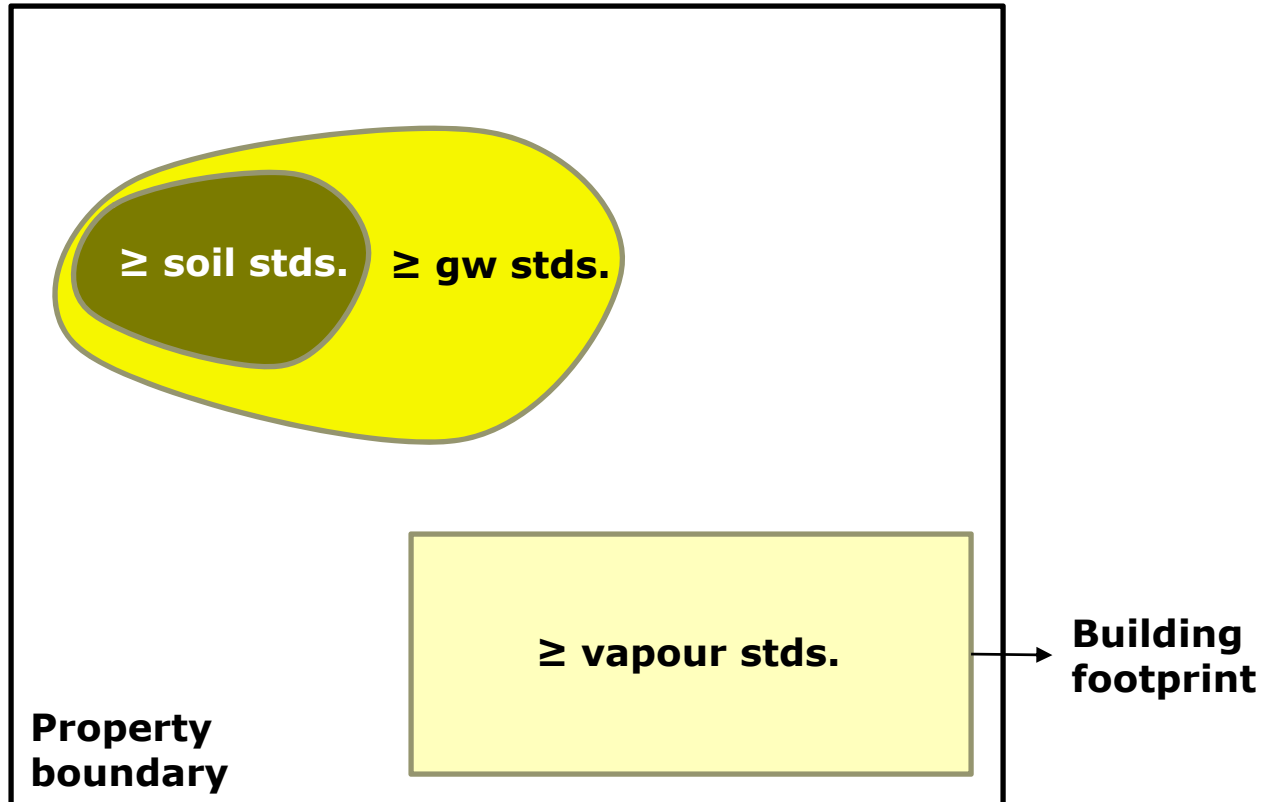
Investigation Objective

2009-04-30



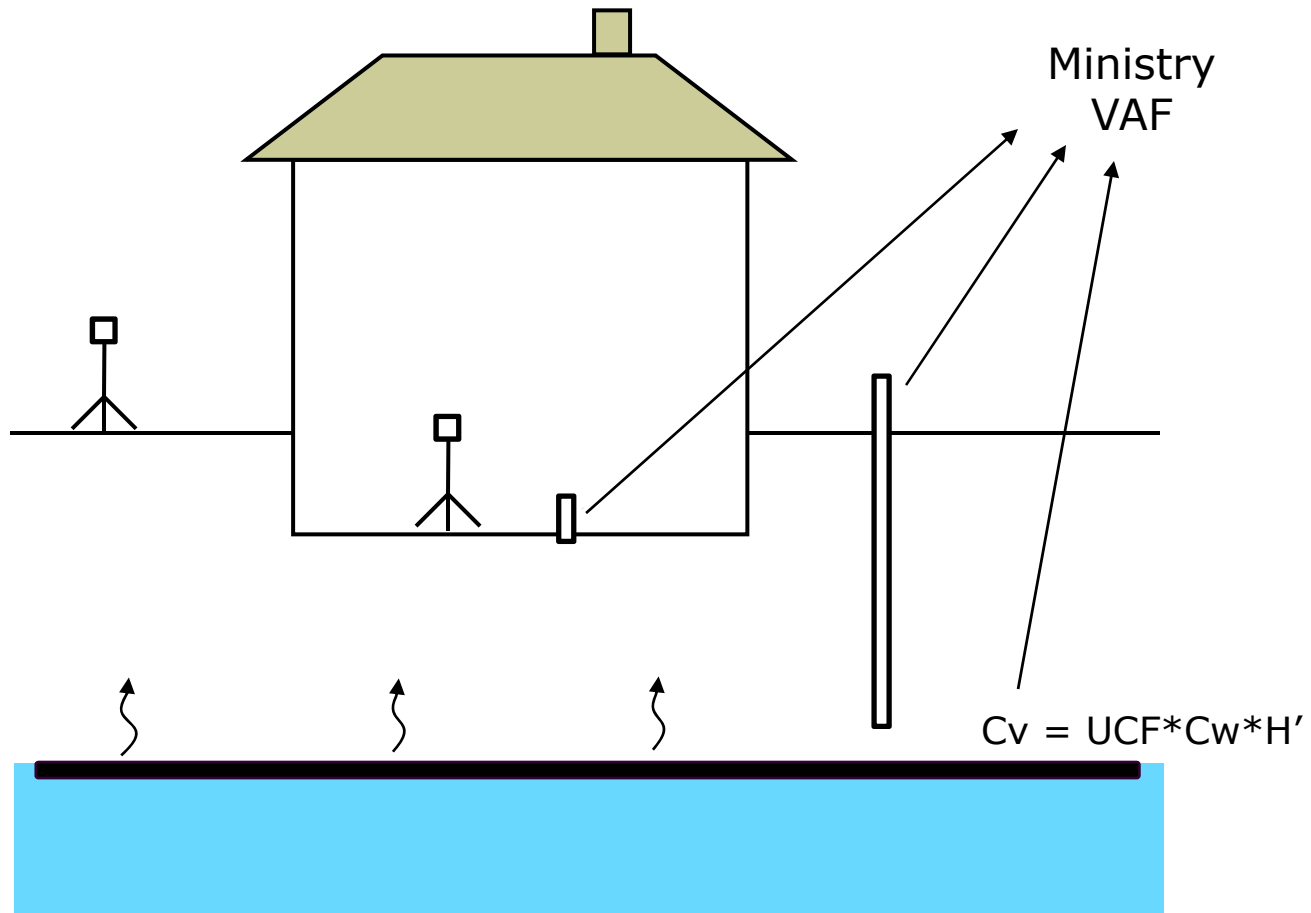
Investigation Objective

2009-04-30



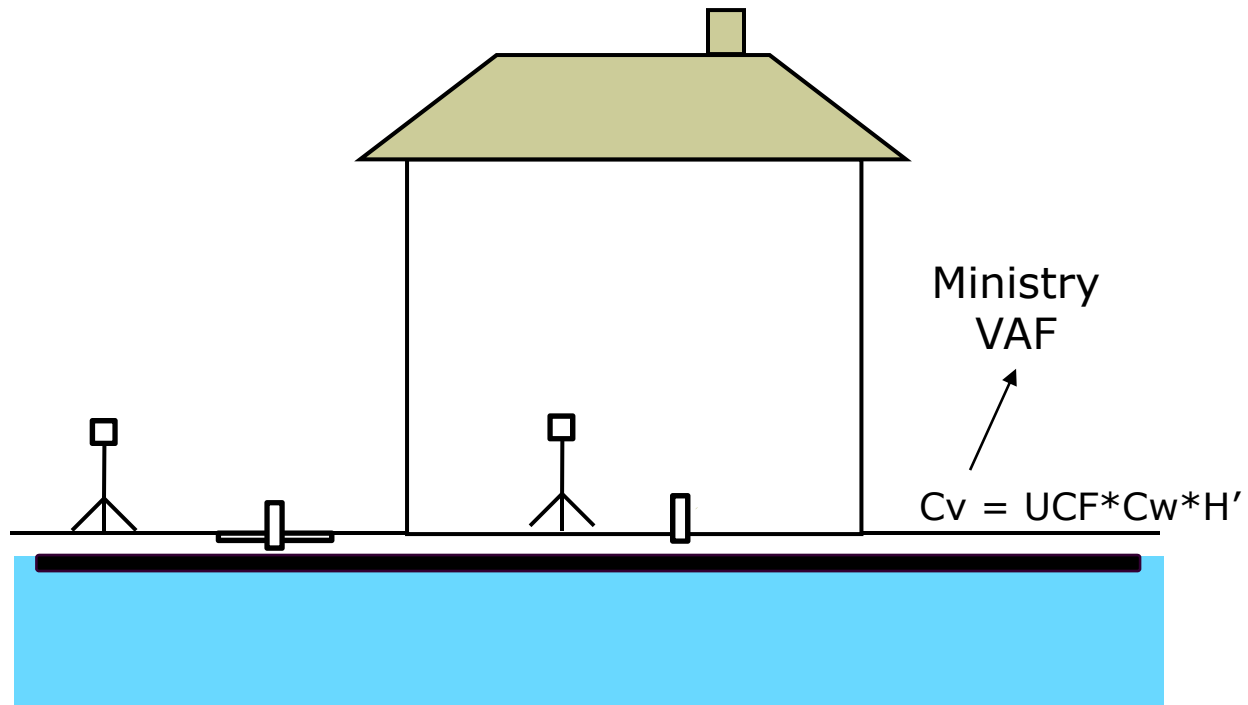
Investigation Options

2009-04-30



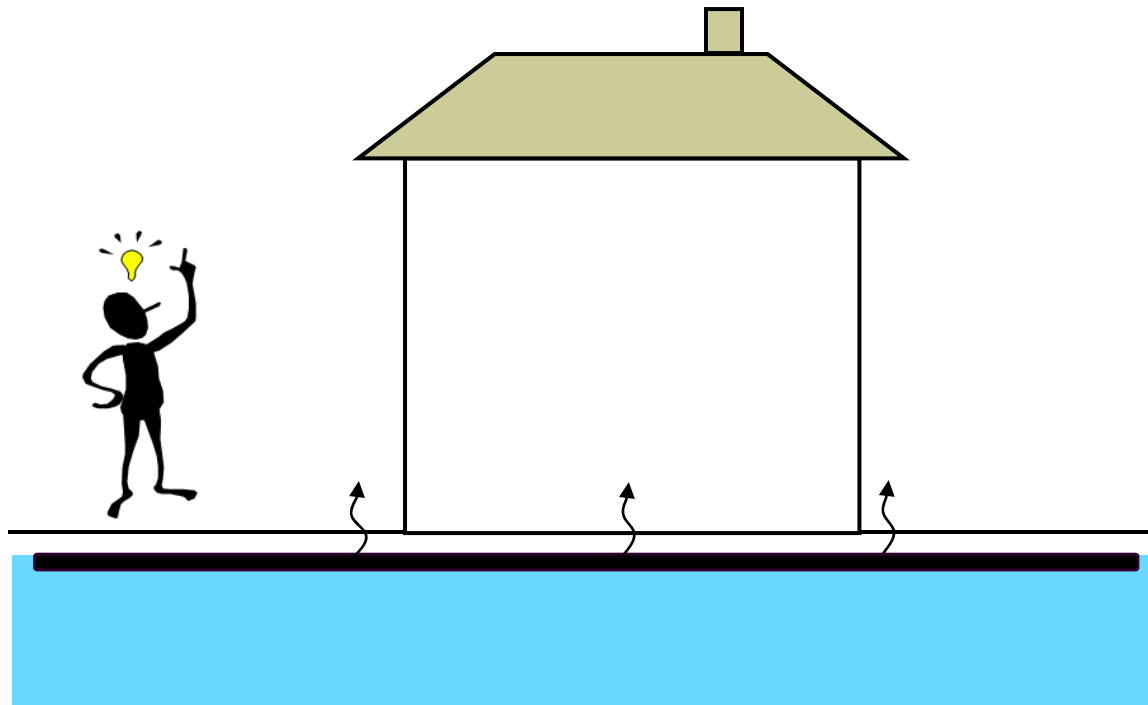
Shallow Source Investigation

2009-04-30



Shallow Source Investigation

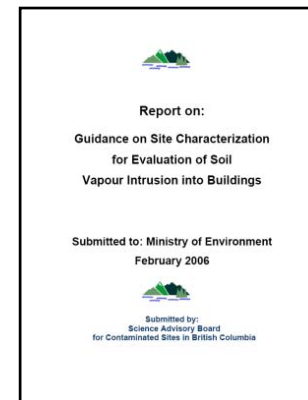
2009-04-30



Modeling



Sampling & analysis



Science Advisory Board

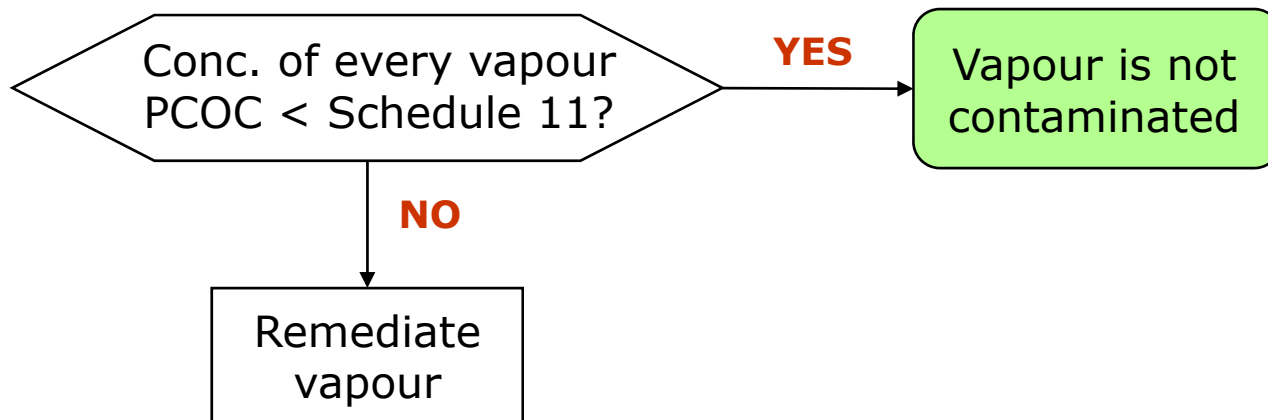
Vapour Attenuation Factors

2009-04-30

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}

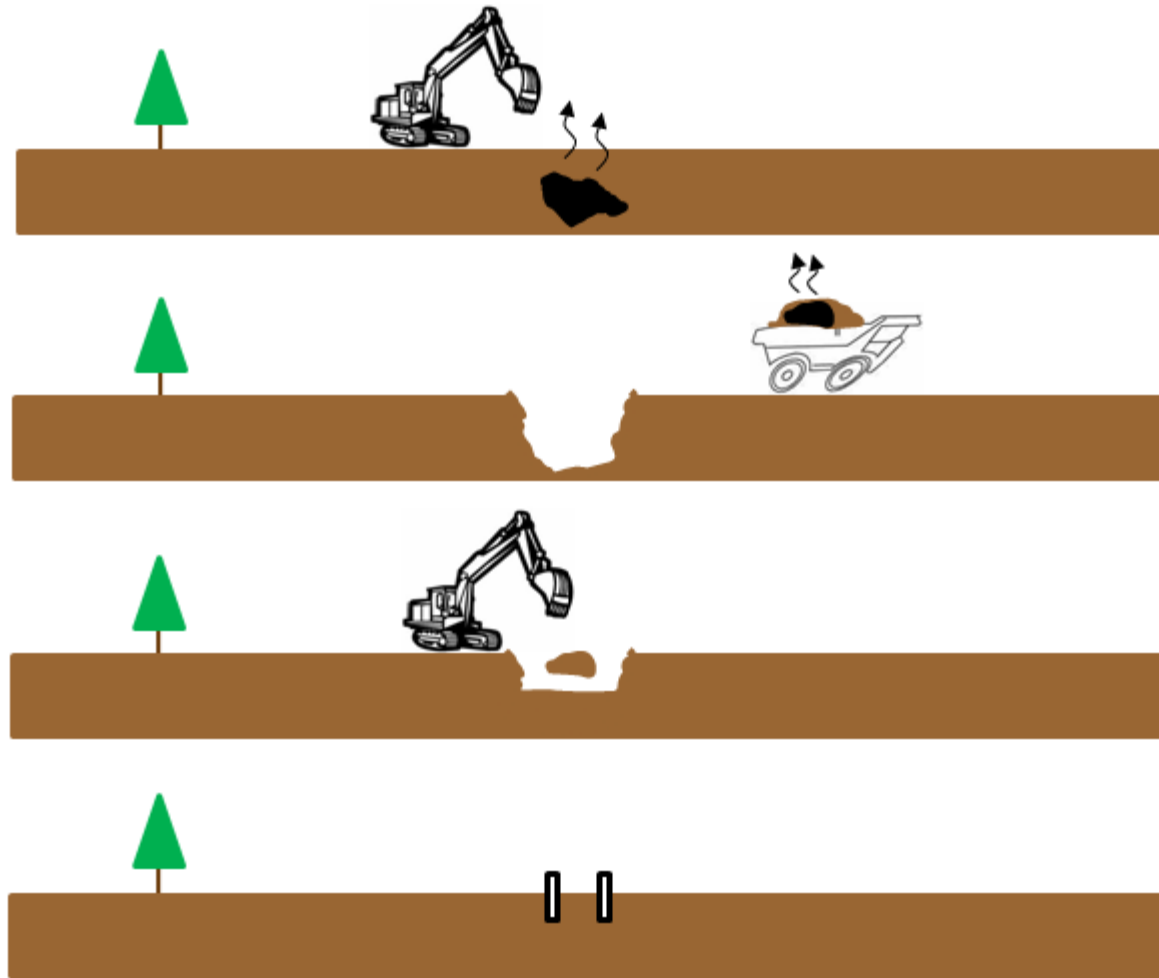
Question 2

2009-04-30



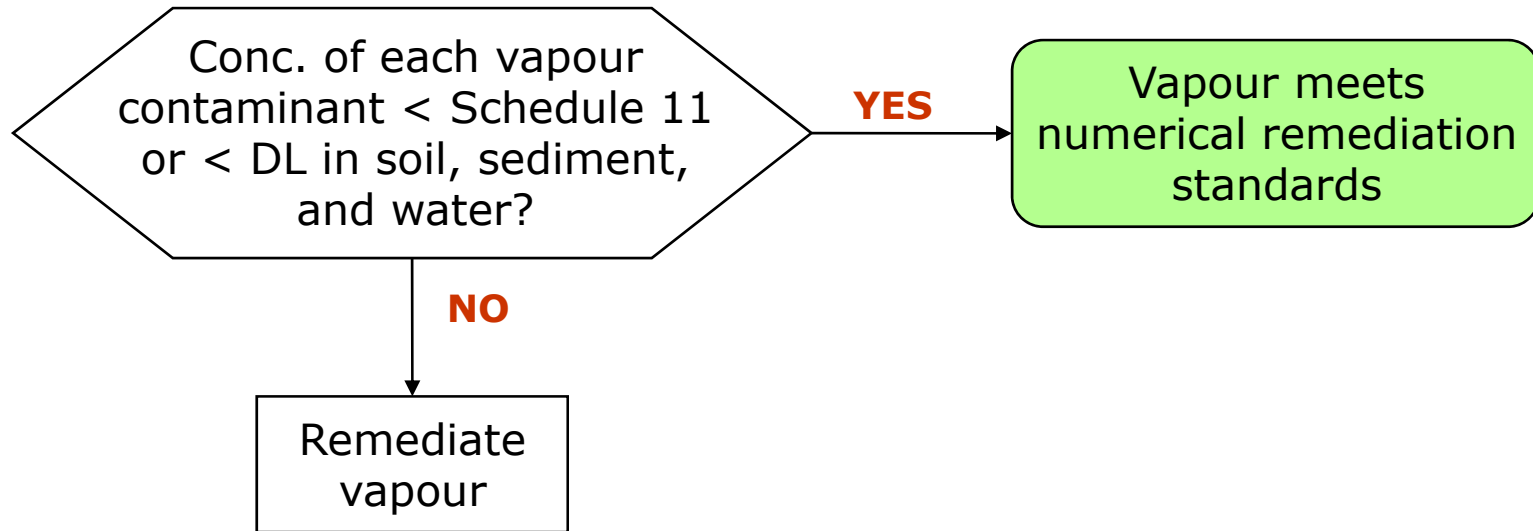
Remediate to Numerical Stds

2009-04-30



Question 3

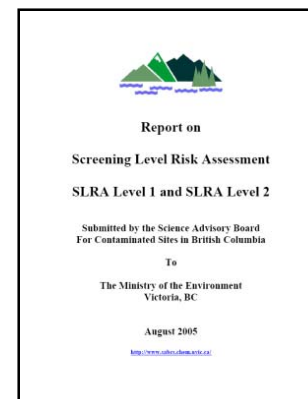
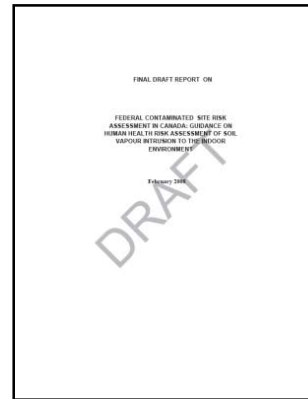
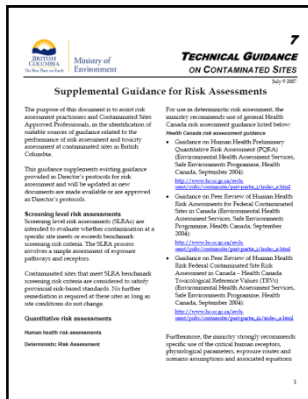
2009-04-30



Vapour Risk Assessment

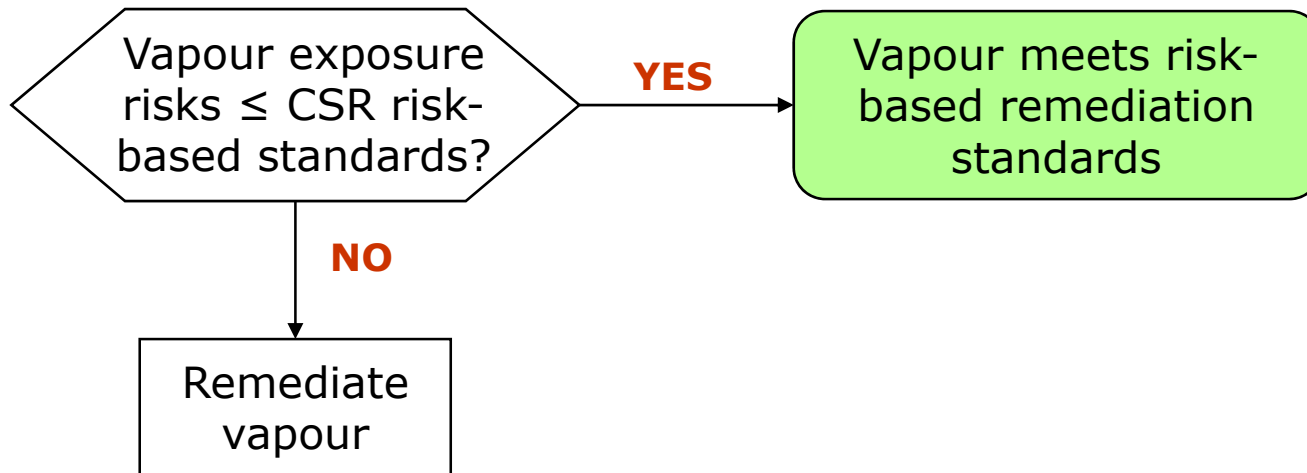
2009-04-30

- Any documented & defensible approach OK
- Literature:



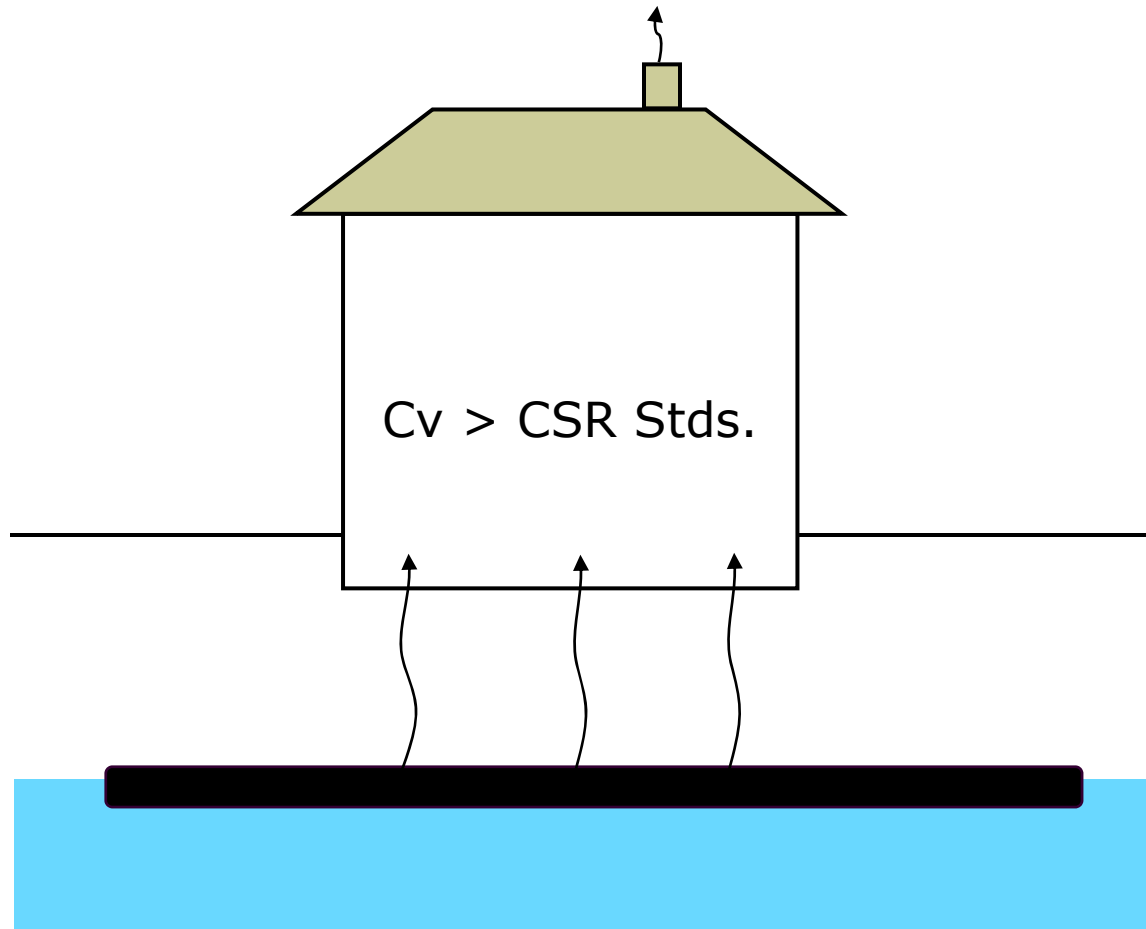
Question 4

2009-04-30



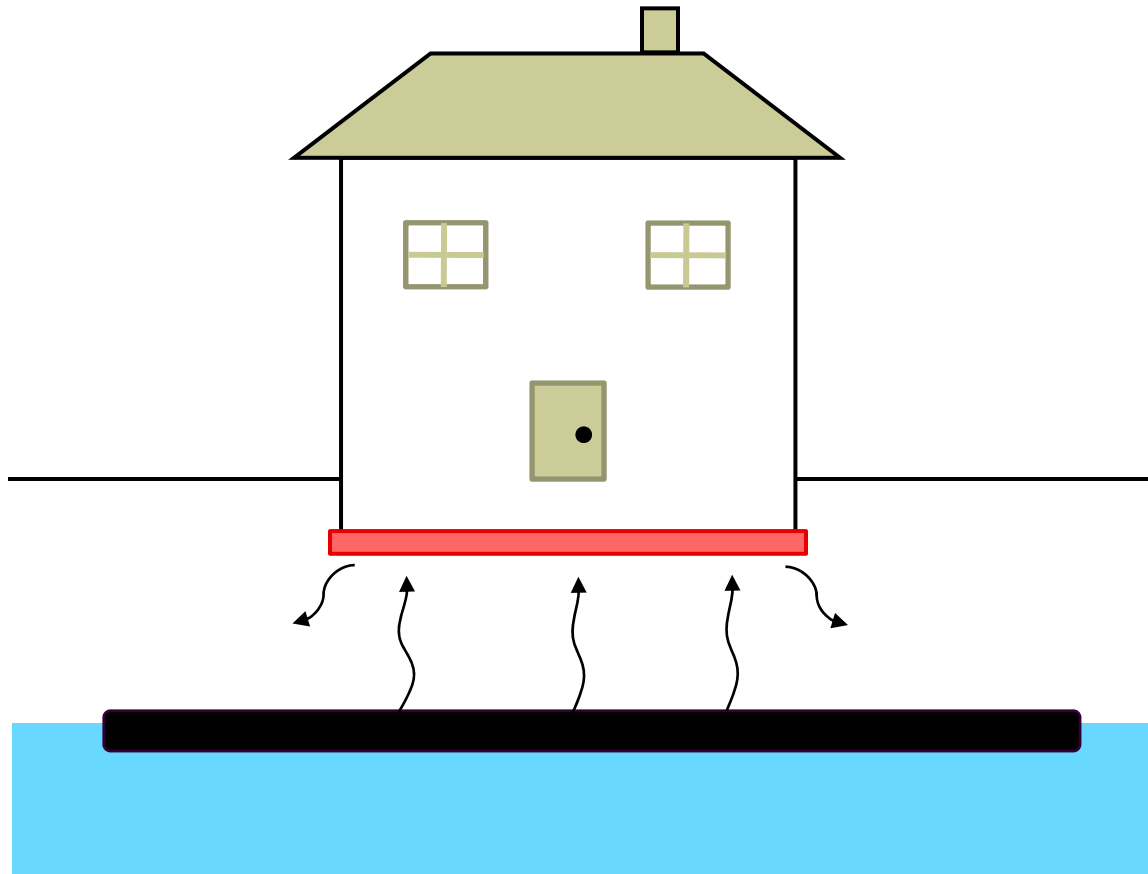
Vapour Management

2009-04-30



Vapour Management

2009-04-30



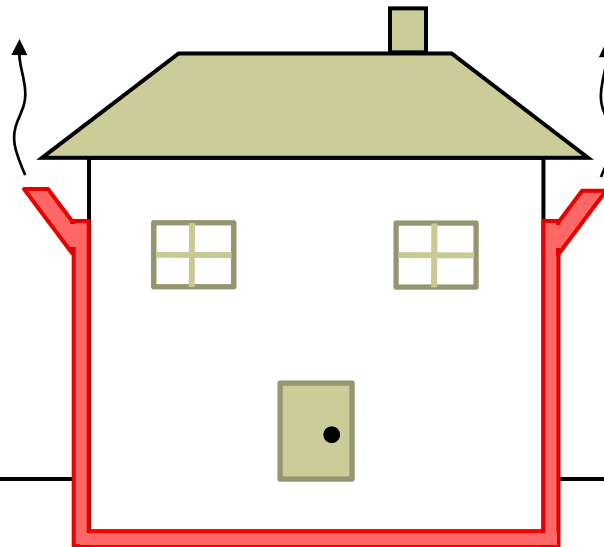
Vapour Management

2009-04-30



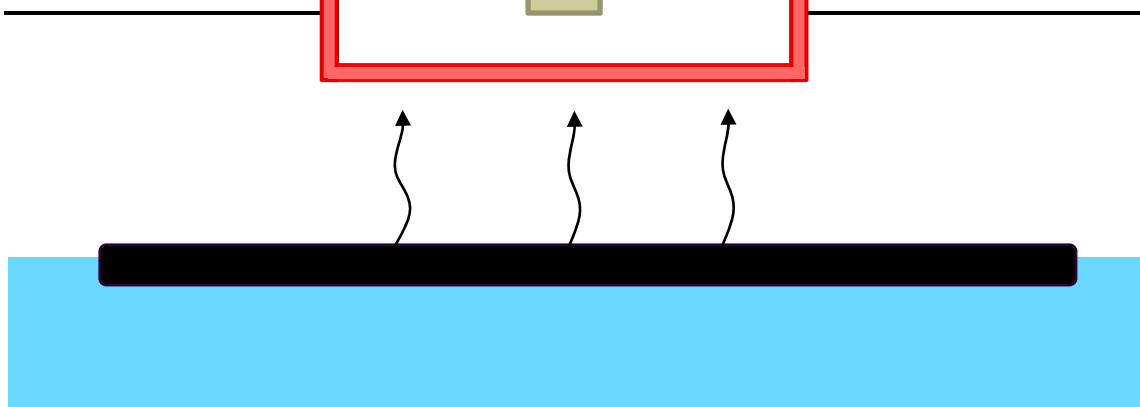
Jane Wong

Jane Wong
Professional Engineer



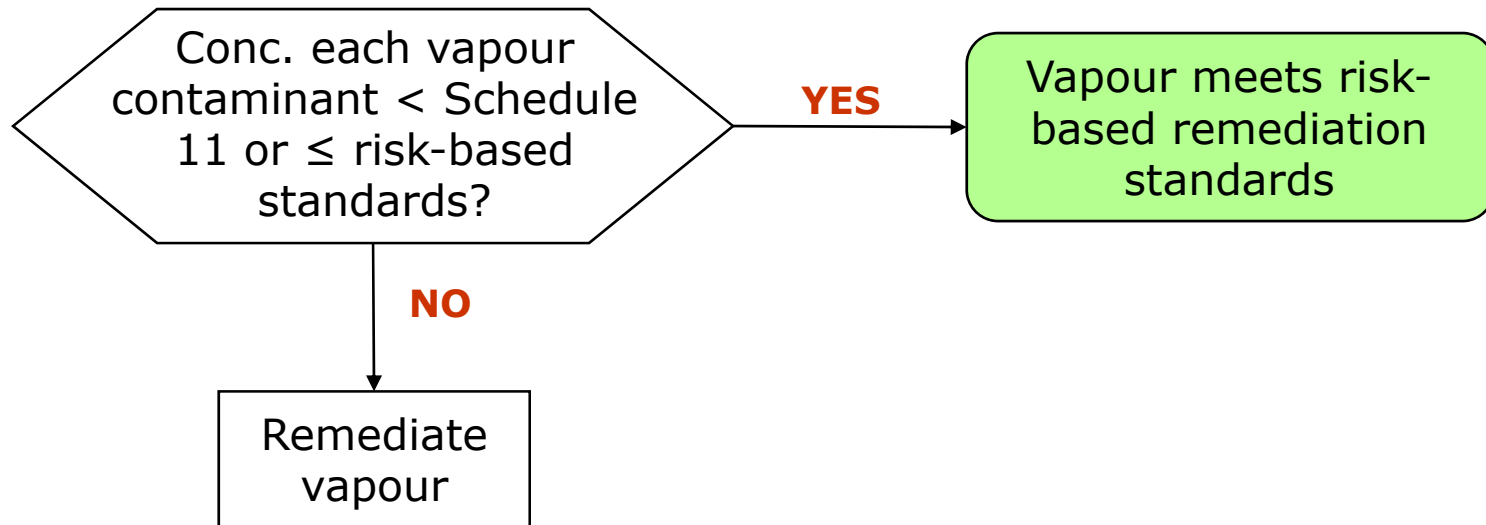
John Doe

John Doe
Approved Professional



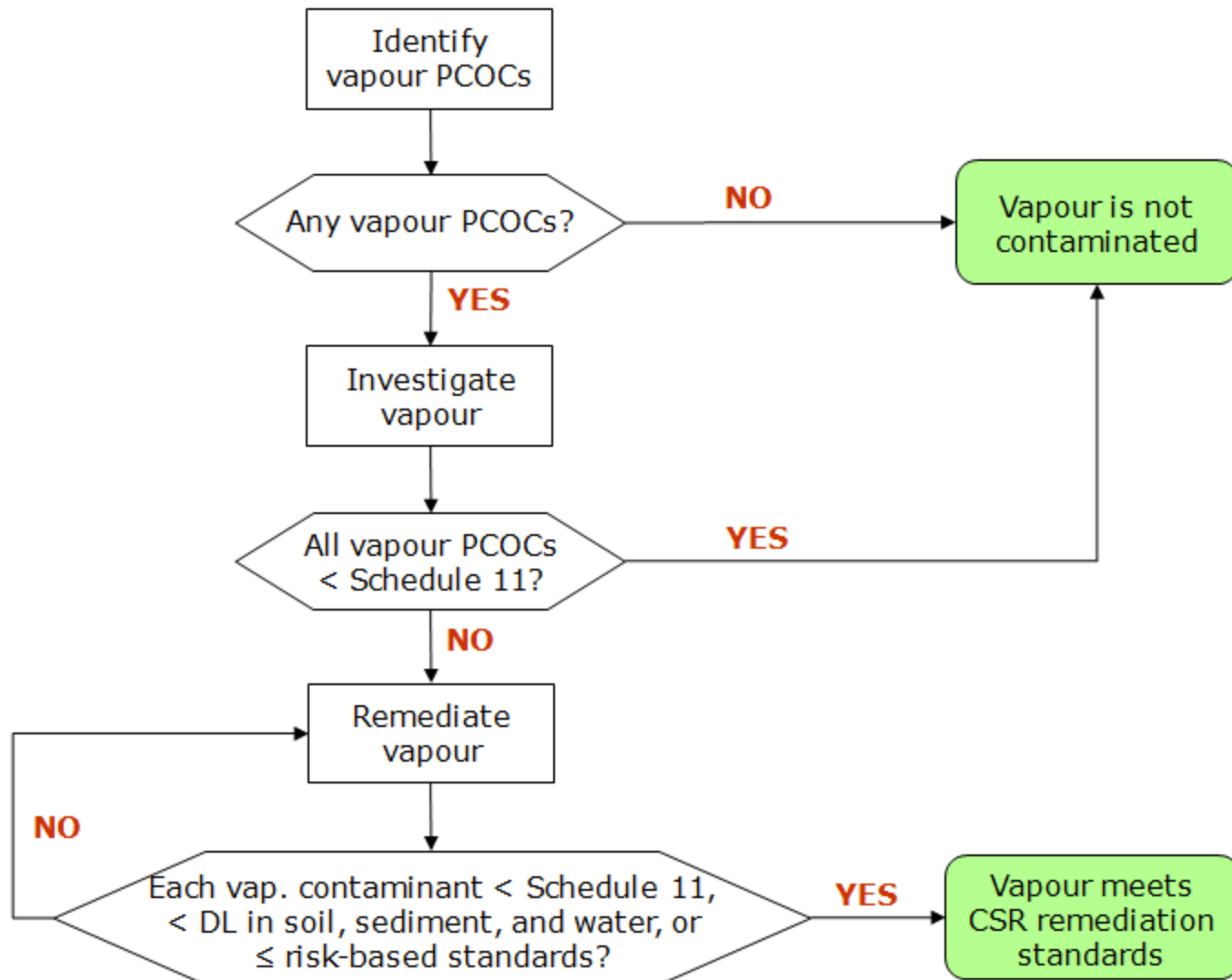
Question 5

2009-04-30



Summary

2009-04-30



No vapour guidance → interim guidance:

- Extended to 30-April-2009

Interim guidance → Technical Guidance 4:

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

- Draft Technical Guidance 4 posted
- Can use immediately
- Can comment until 20-March-2009
- Send comments to colm.condon@gov.bc.ca