CSAP

SOCIETY OF CONTAMINATED SITES
APPROVED PROFESSIONALS
OF BRITISH COLUMBIA

Performance Assessment Committee

Update and Lessons Learned

Chuck Jochems, P.Eng.
Chair, Performance Assessment Committee

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Performance Assessment Committee Members

Chair: Chuck Jochems, P.Eng.

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Delegated Members:

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- Gary Hamilton, P.Geo.
- Duncan McDonald, P.Eng.
- Stefan Quaglia, R.P.Bio.
- Tara Siemens Kennedy, P.Chem.

PAC Agenda

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- Overview of PAs and Submissions YTD

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- ENV requested Focused Reviews

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- PA Process Overview

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- Administrative Reminders

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- PA Lessons Learned
- Review Services Committee (RSC) Update

PAs and Submissions YTD

Summary of PAs to date (as of Oct 27, 2023)

Item	Number	Notes
Active PAs	9	
Sufficient	6	4 at Stage 1 Findings
Deficient	0	
Total PAs	15	11 random and 4 non-random

- Total of 84 Submissions received by CSAP
- 1 in 8 frequency (1 in 6 frequency - NRPAs included)

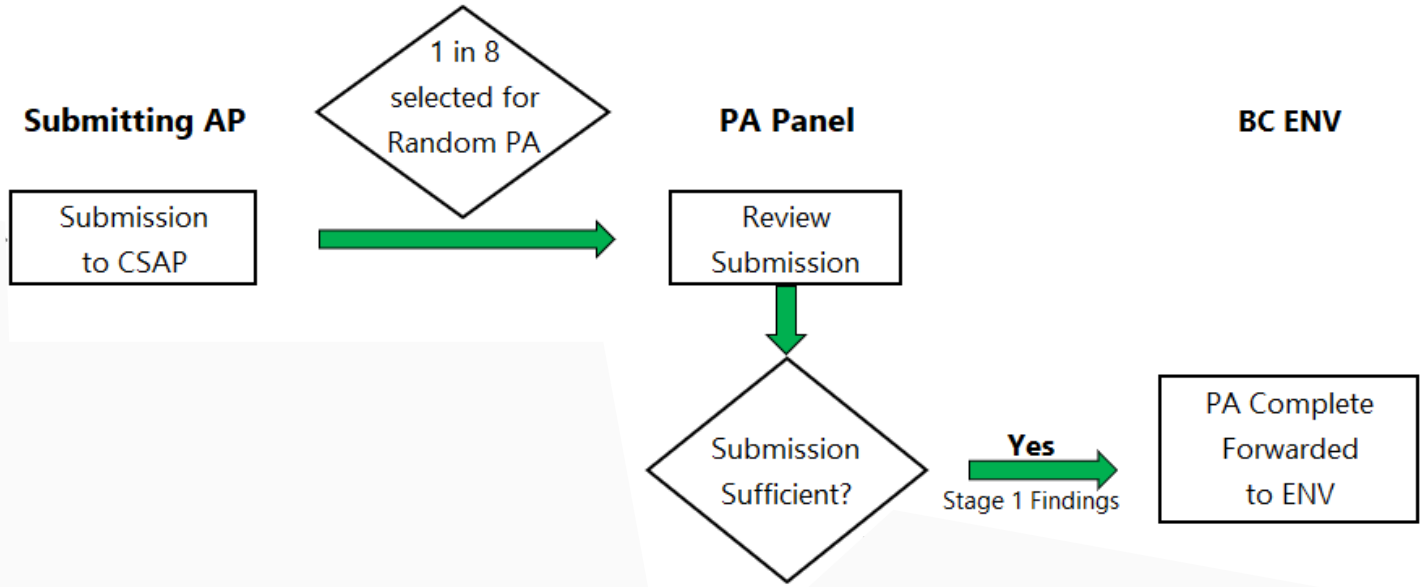
PAs and Submissions YTD

- 4 Non-random PAs
  - 1 Site-specific
  - 1 Discipline Committee measures
  - 1 from Focused Review
  - 1 at request of ENV
- 4 Focused Reviews
  - 3 at request of ENV
  - 1 from Detailed Screening

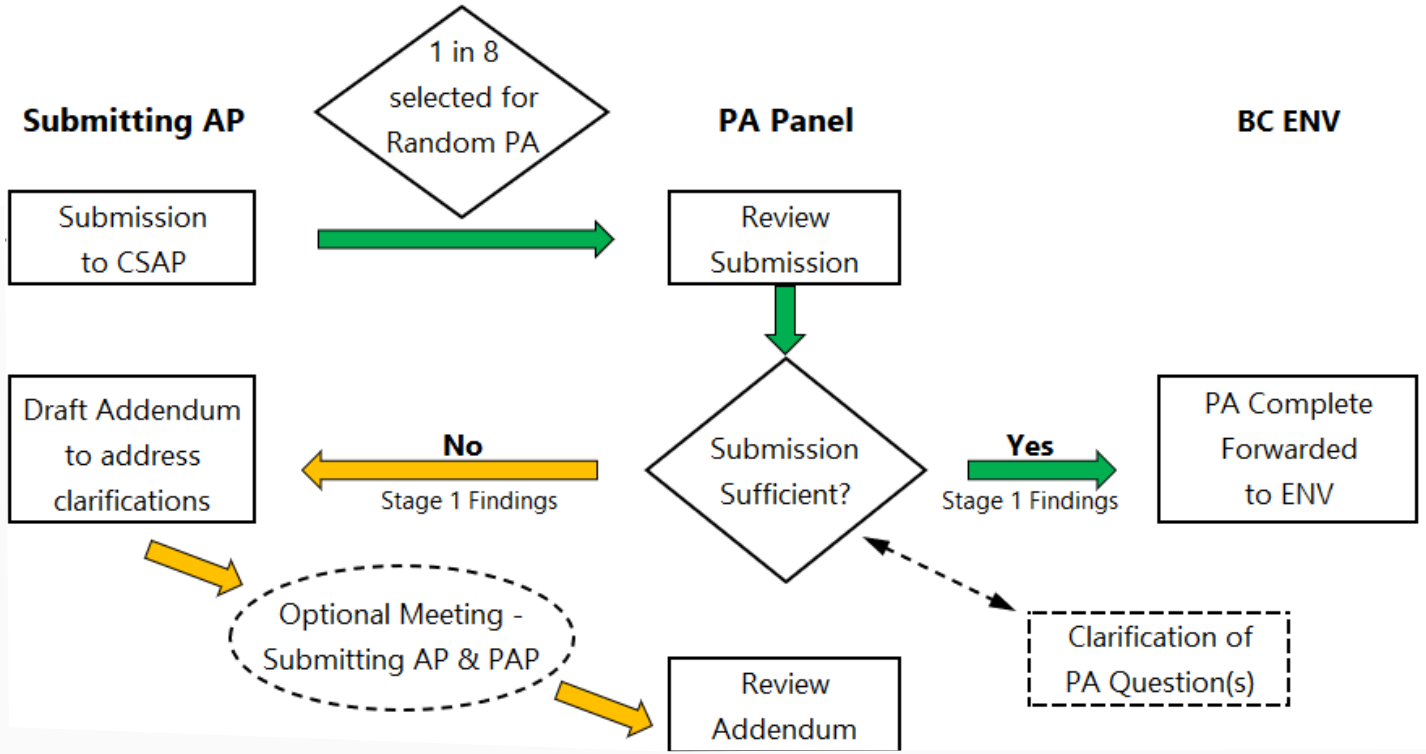
ENV requested Focused Reviews

- ENV requests are referred to PAC
- Focused Review is completed by a DM
- SDM given opportunity to review FR findings for 10 days
- If SDM agrees, FR findings is forwarded to Submitting AP
- If SDM recommends NRPA, then results of FR are not shared

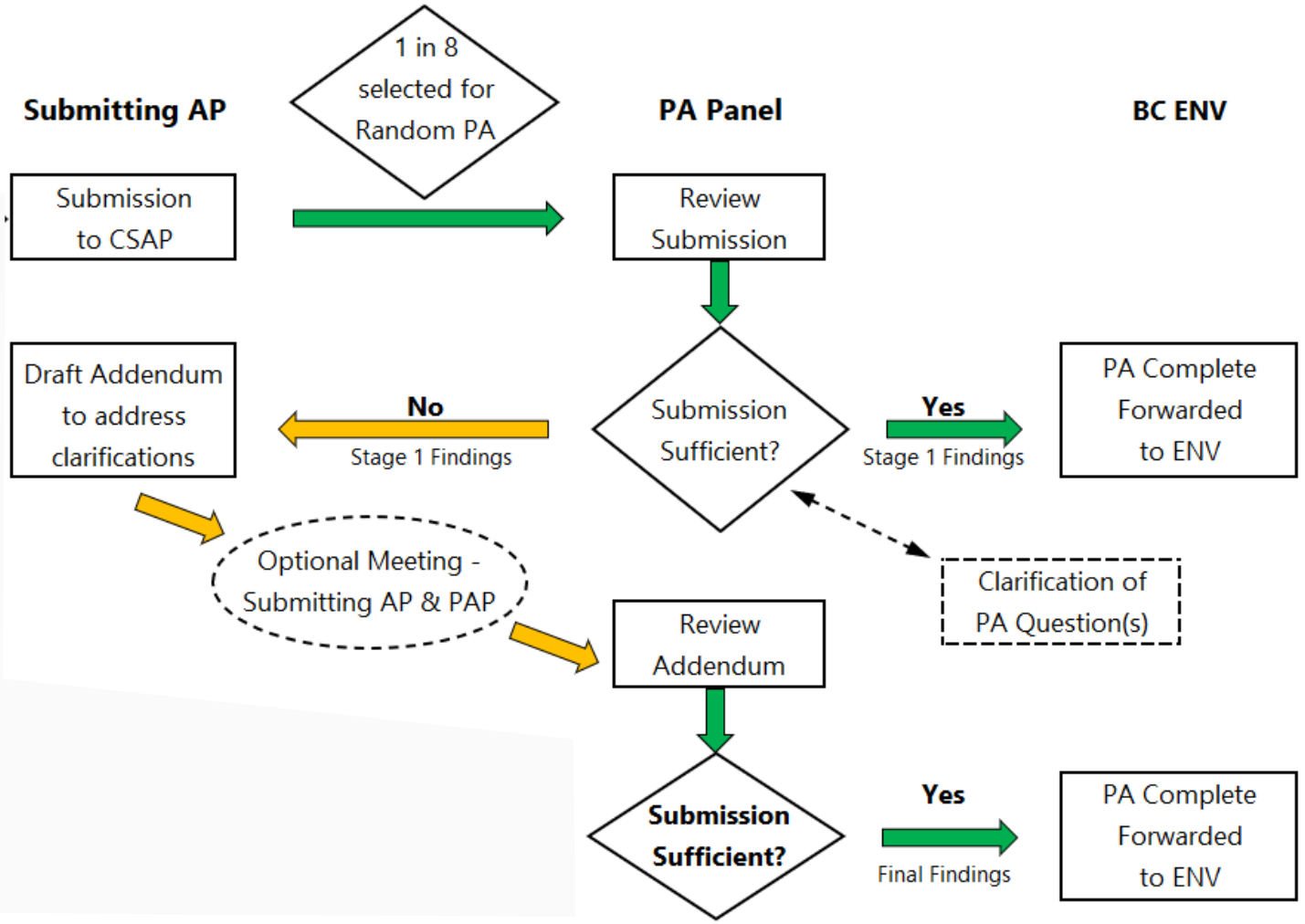
PA Process Overview



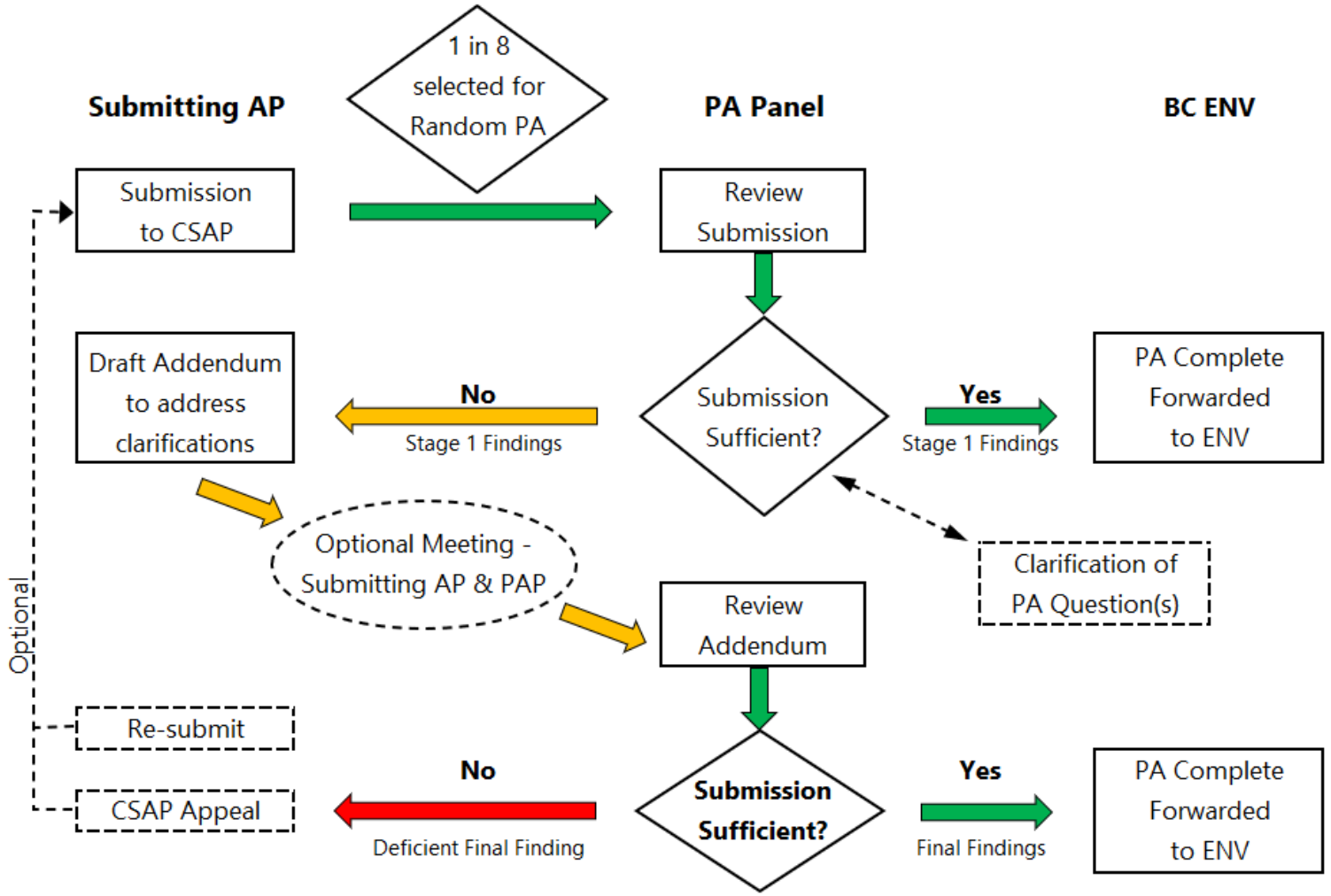
PA Process Overview



PA Process Overview



PA Process Overview



Administrative Reminders

- Addendums are to be addressed to clients, not CSAP or PAC
- Final Addendums become part of the report record in support of Certification Documents (i.e., draft document + SoSC)
- ENV can request Addendum after the submission leaves CSAP at SDM's discretion
- Be mindful of deadlines noted in DM Letters, as several reminders have been issued recently

Administrative Reminders

- It is the Submitting AP's responsibility to confirm the supporting documents are complete for a Submission
    - For example, reports include all attachments:
        - tables, figures, borehole logs, appendices, etc.
- Recently, ENV required a re-submission as a supporting report was missing information

PA Lessons Learned

Category	Item	Details
Stage 1 PSI	Missed PCOCs	Only metals were identified as PCOCs in suspect fill and did not include other common parameters.
Stage 2 PSI	PCOCs not analyzed	Not all PCOCs identified in Stage 1 were tested for, with no rationale provided.
Stage 2 PSI	Soil vapour screening	Non-fuel VOCs refined based on ND concentrations in soil and groundwater, but not all parameters analyzed. Screening also based on field observations, with no supporting data.
Stage 2 PSI	Inadequate investigation	APEC assessment considered inadequate due to investigation locations (not worst-case location) and density.
Standards	Soil vapour	Report indicated vapours passed based on ND naphthalene in soil. However, naphthalene concentrations were detected, and soil vapour modelling failed to meet applicable standard.
ENV Policy	Not eligible for P6	Contaminated fill extended off property but no P6 pre-approval was obtained for part of a site.

PA Lessons Learned

Category	Item	Details
Standards	Soil	Site-specific standard (SSS) calculated using Protocol 2 and 27. However, SSS was questioned given some rationale was not very conservative. Bulk concentrations in soil were not collected at the same time in soil samples used for P27 leachate testing and results from previous investigation were relied upon. Flat gradient calculated using nearest cm groundwater elevations as opposed to mm, which would have provided a more conservative gradient for groundwater flow calculations.
DSI	Delineation	Show vertical delineation of groundwater on cross-sections.
Remediation	Adequacy	Show investigation sample exceedance locations (i.e. contamination) on CoR plans and cross-sections to confirm removal and remediation.

PA Lessons Learned

Category	Item	Details
ENV Policy	Protocol 13 -Precluding Conditions	Aquifer stratigraphy at site described as 'Sand, gravel, cobbles with some boulders'. Section 3.2 of Protocol 13 has a precluding condition "*In addition, this protocol must not be used at contaminated sites where any of the following conditions are present: • very high permeability soil (for example, cobbles)*". It also states *"A screening process, including a written discussion with detailed rationale, must be used to determine if any precluding conditions may be present at the site. The written discussion must demonstrate consideration of each precluding condition and provide rationale for determining applicability and supporting site data"*. The Submitting AP rationalized laminar flows exists at the site, not turbulent flow. ENV indicated that a proponent could provide data and supporting rationale to demonstrate that the precluding condition is not considered applicable to the site. **ENV pre-approval would not be necessary.**

PA Lessons Learned

Category	Item	Details
Risk Problem Formulation	Current & Future Scenarios	Ok for HHRA. Clarification requested on whether the ERA based on current conditions adequately protects future conditions. Response to S1 Findings was that there were no improvement plans for the park-like site, which was considered adequate.
Problem Formulation	COPC Screening	The full (post-remedial) dataset relied upon for screening and statistics was initially missing, which may be a common issue.
Risk Management	Risk Controls	Initial report contained risk controls 1) against potable use of groundwater and 2) maintain 'clean soil capping' on a municipal roadway portion of the site. It was later clarified these risk controls were not been supported by the assessment findings and were not necessary. **Lesson to QPs is to avoid putting forth risk controls unsupported by the assessment findings.**

RSC Update

- Through the RSC, CSAP reviews Annual Reports and similar documents that are typically produced to satisfy Director's requirements in Schedule B conditions.

- A reminder that RSC does not review Annual Reports associated with Scenario 3 release (i.e., SDS-related) requirements. Those types of reports should be submitted to the Site Identification group at ENV (SiteID@gov.bc.ca).

- We encourage all practitioners to familiarize themselves with Application Types to be sent CSAP vs. ENV for review, as noted on the **RSC webpage**.

RSC Update

- Last year, most submissions reviewed by RSC were associated with AIPs that had been issued in the past 2 to 3 years.
    - The details required in an AIP Annual Report are specified in Schedule B (i.e., remedial progress compared with the Remedial Plan schedule).
    - We encourage submitters to directly speak to those requirements in reporting to avoid CSAP clarification questions during the review process.

CSAP Q&A for Members

- December 2023 Launch anticipated

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Detailed Screening
Common Errors and Omissions

Tara Siemens Kennedy, MET, P.Chem.
Chair, Detailed Screening Sub-committee

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Detailed Screening Spreadsheet – Updated 2021

1. Summary Worksheet
2. CSAP DS Checklist
3. SoSC
4. Regulatory Considerations
5. Consultations

Available on CSAP website (appendix in CSAP Administrative and Detailed Screening Guidance)

SoSC Section 4.2
Site Conditions, Water Use

Include explicit statements to address all water uses

Address both current and future water use

Include sufficient details to show compliance with P21 for every geological unit exempted from a water use

SoSC Section 4.4
Applicable Numerical Standards

Soil (CSR Schedule 3.1):

Property	CSR Land Use							
		AL	PL	RL_{LD}	RL_{HD}	CL	IL	Other
Subject Site	Current	☐	☐	☐	☐	☐	☐	☐
	Proposed	☐	☐	☐	☐	☐	☐	☐
Receiving site *(if completed in support of a Contaminated Soil Relocation Agreement)*		☐	☐	☐	☐	☐	☐	☐
Offsite impacted property / management area		☐	☐	☐	☐	☐	☐	☐
Has a Protocol 2 (site-specific) or Protocol 4 (background) standard been applied?						Yes ☐		

Substances ~~remediated~~ evaluated in soil for Residential soil use:

To meet local background concentrations:

<List substances remediated to meet local background concentrations.>

Include substances evaluated to BG or P2 SSS (Section 4.4 and 4.6 of SoSC and in Schedule C)

In Section 4.6 of SoSC, include note indicating evaluated to BG or SSS (i.e., not carried forward as COC)

Revise Schedule C template text to indicate evaluated to BG or SSS

SoSC Section 4.4
Applicable Numerical Standards

Vapour (CSR Schedule 3.3): *(Check all that apply)*

	AL, PL, RL	CL	IL	Parkade	Other
Soil Vapour	☐	☐	☐	☐	☐
Notes (if other is specified above, include description of assumptions for both current and future development of the site that the selected vapour attenuation factors are based on)					

Address both current and future vapour use and provide details on how VAFs were selected

SoSC Section 4.6
AEC and Contaminant Summary

				Extent of Contamination			
AEC / APEC # (Use same #s as for APECs in Table above)	**Contaminant of Concern**	**Medium** (e.g., soil, groundwater, sediment, vapour, surface water, other)	**Maximum Measured Concentration** (indicate units)	**Area (m^2)**	**Depth Range (m)**	Add	Delete
						+	-
						+	-
Notes (e.g. site type, classification, relevant approvals etc.):							

Include Site Type (i.e., Type 1 or 2 for risk-based submissions)

Include Site Risk Classification

Include background soil or groundwater levels set under P4 or P9, or SSS

Spelling of Substances

- **Schedule C and All Sections of the SoSC**
  - Spelling of substances **MUST** match the CSR Schedules

A few tips:

- Substances are not capitalized per CSR schedules
- Remember xylenes (Sch 3.1) vs. xylenes, total (Sch 3.2 + 3.3)
- Numbering follows chemical name (e.g., dichloroethane, 1,2-)
- NAPL is listed as ‘non-aqueous phase liquids’ in the CSR Schedules 3.1 and 3.2
- Non-regulated substances do not get listed in Schedule C
- Check that CAS numbers are accurate

Document List in SoSC and Schedule D

- BC ENV webpage “Preparing Draft Certification Documents for the Director” indicates that in addition to technical reports, the following must be included in Schedule D:

> ..Summary of Site Condition, performance verification plans, communication records, preapprovals under Protocol 6 and any other authorizations, approvals or director's decisions that may be applicable to the contaminated site.
>
> When applying for a Certificate of Compliance after an Approval in Principle was issued, list all relevant documents from the Approval in Principle in the Certificate of Compliance.

Questions?

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Protocol 2 Site-Specific Standards

Development and Use of the CSAP P2 SSS GPM Relief Book Spreadsheet Tools

Erin Robson, P.Eng., CSAP &
Ilya Biniowsky, P.Geo., SLR Consulting

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Presenters:

Erin Robson, Numerical Standards CSAP and Contaminant Hydrogeologist with SLR Consulting.

- Based in Kamloops, with 23 years of experience in contaminated site assessment and remediation in BC.
- Developed P2 SSS for over 20 projects across BC since 2017.

Ilya Biniowsky, Senior Contaminant Hydrogeologist with SLR Consulting.

- Based in Vancouver, with 21 years of experience in contaminated site assessment and remediation in BC.
- SLR Data management lead and CSAP GPM relief tool developer.

P2 SSS Resources

- CSAP PD Webinar – September 15, 2021: Getting to Know the Protocol 2 Site-Specific Numerical Soil Standards
  - https://csapsociety.bc.ca/members/pd-webinar/
- Protocol 2 – Site-Specific Numerical Soil Standards
- Protocol 27 – Soil leachate Tests for Use in Deriving Site-Specific Numerical Soil Standards
- Technical Guidance 13 – Groundwater Protection Model
- Technical Guidance 24 – Site-Specific Numerical Soil Standards Model Parameters
- CSR Schedule 3.1 Part 1 – Matrix Numerical Soil Standards

The Project

Objectives:

- To raise awareness of the relief that may to obtained using P2 SSS vs CSR Matrix numerical standards
- To create a practical reference for practitioners

Deliverables:

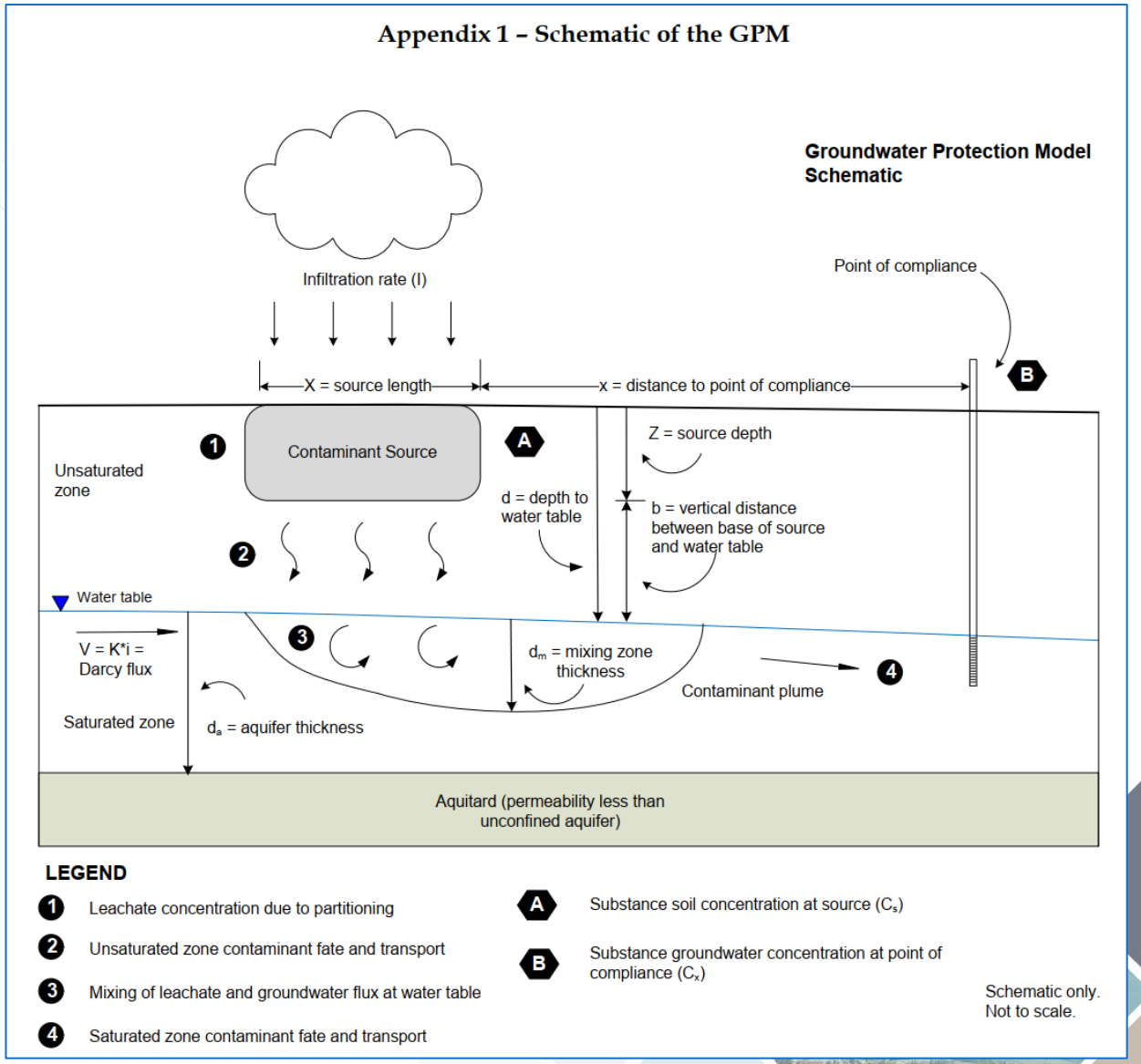
- Memo summarizing key points
- Excel tool to bookend the range of useful modified input parameters

The Model

- 4 processes
- 18 modifiable inputs
- 40 CSR-Regulated Substances

Study focused on 6 inputs:

- Infiltration (I)
- Fraction of organic carbon (foc)
- Distance to point of compliance (x)
- Vertical distance between base of source and water table (b)
- Average linear velocity (v)
- Soil pH



The Outcome

- Technical Memo: Using the GPM and P2 SSS
  - Overview, guidance and instructions

- Four Separate Excel Spreadsheet Tools
  - CSAP P2 SSS GPM Relief Book WLn_WLr.xlsx
  - CSAP P2 SSS GPM Relief Book AL_PL.xlsx
  - CSAP P2 SSS GPM Relief Book RLld_RLhd.xlsx
  - CSAP P2 SSS GPM Relief Book CL_lL.xlsx

Key Takeaways

Organics:

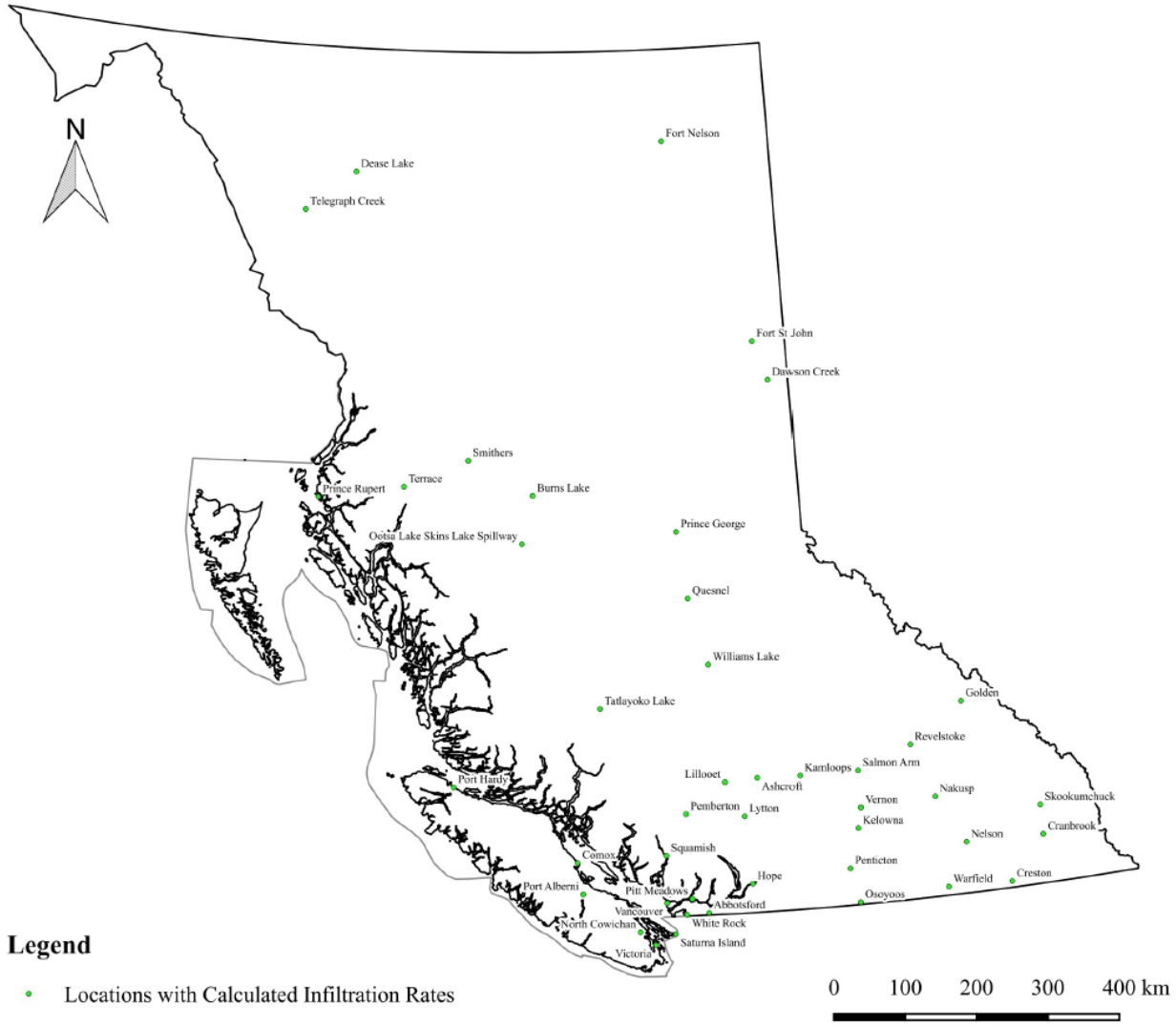
- Inputs that enhance bioattenuation
  - foc, b (d-Z)
  - low v
- Inputs that increase dilution and dispersion
  - x
  - high v
- Organics that readily degrade will respond more to modifications
  - Benzene vs PERC

Inorganics:

- Greatest relief with inputs that increase dilution and dispersion
  - x
  - high v
- pH has largest effect and must be site-specific for all modifications (not optional)
- pH may enhance or diminish other mods

Inputs – Infiltration Rate

- Relative model sensitivity:
  - LOW (organics)
  - HIGH (inorganics)
- Simple to execute
- Allowable: ≥ 80 mm/yr
- Source: P2 Appendix I Table 1 values
- 44 Urban centres listed
- Study used 13 discrete infiltration rates paired with 8 P4 background regions



Inputs – Fraction of Organic Carbon

- Relative model sensitivity: HIGH (organics only)
- Allowable: 0.001 – 0.050
- Source: Site-specific data
- Limitations: Only one site-specific foc value to represent the entire site
- Higher end foc values likely only represent peat/muskeg

Need a sufficiently robust CSM to justify selected foc value

Inputs – Distance to Point of Compliance (x)

- Relative model sensitivity: HIGH (organics and inorganics)
- Allowable: 10 – 500 m
- Limitations on use!
  - DW / IW / LW – if site GW meets the applicable standard, then x can be modified to lateral distance from:
    - Source -> Down Gradient Property Boundary
  - AW – if GW at the down gradient property boundary meets the applicable AW standard, then x can be modified to lateral distance from:
    - DG Property Boundary ->10 m from the HWM of the receptor

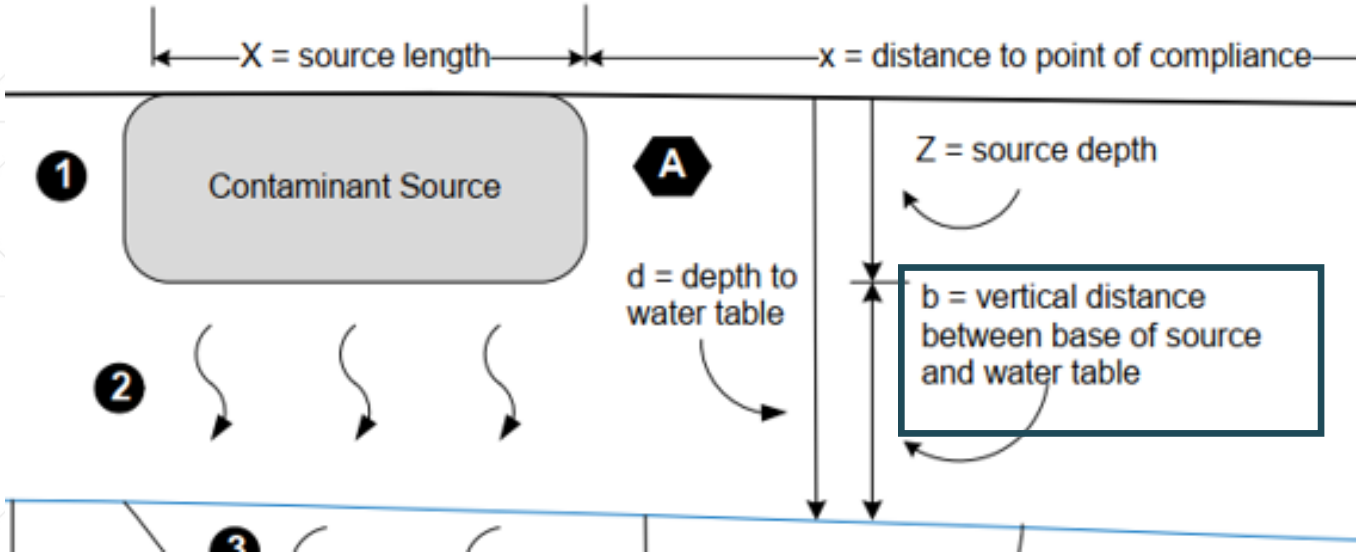
Site-Specific Source Dimensions are also required

Inputs – Depth from Source to Water Table (b)

- Model sensitivity to

  b = d-Z: HIGH (organics only)

- Source: Site-specific data
- Site-Specific source dimensions are required



Calculating Source Dimensions

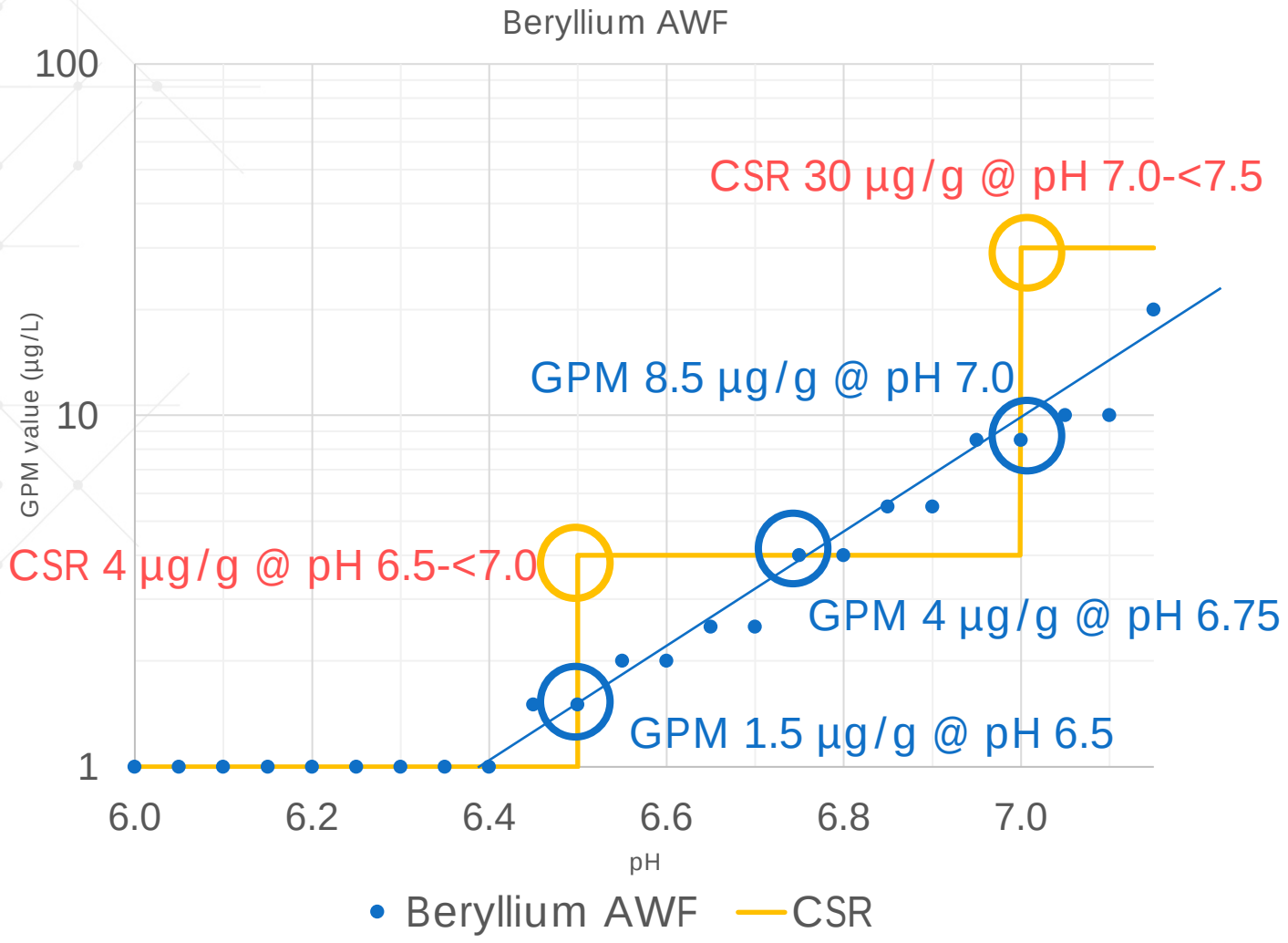
- Source dimensions (length, width, depth) – prescriptive methods for organic and inorganic sources must be followed – P2 Section 5.1.1
- PHC source zone is defined by concentrations of VHs_{6-10} > 100 ppm or either $EPHs_{10-19}$ or $EPHs_{19-32}$ > 1000 ppm
- Non-PHC source zones are defined by either:
  - Soil concentrations > Schedule 3.1 Part 1 standards,
  - Soil concentrations > a SSS derived by modification of select allowable GPM input parameters (e.g. I, porosity, foc, pH, K, i), or
  - Soil concentrations > Protocol 4 background

Inputs – Groundwater Velocity (v)

- Model sensitivity: HIGH (organics and inorganics)
- Influences various model processes differently
  - Low v → higher attenuation of organics
  - High v → higher dilution and dispersion effects for both organics and inorganics
- Calculated from hydraulic conductivity (K), gradient(i) and effective porosity
- Source (per TG24): Site-specific data for K and i in the ***shallowest unconfined flow system***
- Cannot be modified if perched water tables present

Inputs – pH

- Model sensitivity: HIGH (inorganics) *but already built into CSR*
- CSR matrix ranges are modelled using the mid-point of the range
- CSR range for 6.5-7.0 is modelled using **6.75**
- GPM default of pH=6.5 can result in lower modelled SSS vs CSR



Inputs – pH

- Typically, High pH → High SSS
  - PCP/Selenium: High pH → Low SSS
- Can affect other modifications as site-specific pH is required
- Unlike CSR matrix standards, only one site-specific pH value to represent the entire site

Need a sufficiently robust CSM to justify selected pH value

Processes and GPM Parameters

Process Stage	Biophysical Processes	GPM Parameter	Useful Range	Parameter Effect on GPM SSS
1. Leachate Generation	Partitioning	fraction of org. carbon (foc) Soil pH	0.005 – 0.05 5 - 9	↑ organics ↑(metals)/↓(PCP)
2. Unsaturated Fate/Transport	Bio-attenuation Dispersion Retardation	Infiltration (I) Depth from source to water table (b = d-Z) fraction of org. carbon (foc) Soil pH	80 - 550 mm/yr 0 – 3.5 m 0.005 – 0.05 5 – 9	↓ ↑ organics ↑ organics ↑(metals)/↓(PCP)
3. Mixing Leachate/GW	Dilution	Infiltration (I) GW velocity (v)	80 - 550 mm/yr 30 – 250 m/yr	↓ ↑
4. Saturated Fate/Transport	Bio-attenuation Dispersion Retardation	fraction of org. carbon (foc) Soil pH GW velocity (v) Distance to Pt. of Compliance (x)	0.005 – 0.05 5 – 9 5 – 30 m/yr 10 – 500 m	↑ organics ↑(metals)/↓(PCP) ↑ organics ↑

Notes:
↑ - increasing parameter increases the GPM SSS value
↓ - increasing parameter decreases the GPM SSS value

Relief Definition

- No Relief
  - GPM result ≤ CSR GW Pathway Std
  - CSR GW Pathway Std > CSR Mandatory Std.
    - E.g. Cu @pH=6.4, AWF

MATRIX 11 - NUMERICAL SOIL STANDARDS[1]
COPPER (CHEMICAL ABSTRACT SERVICE NUMBER 7440-50-8)

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6	COLUMN 7	COLUMN 8	COLUMN 9	Note
Site-specific Factor	Wildlands Natural (WL_N)	Wildlands Reverted (WL_R)	Agricultural (AL)	Urban Park (PL)	Residential Low Density (RL_{LD})	Residential High Density (RL_{HD})	Commercial (CL)	Industrial (IL)	2
HUMAN HEALTH PROTECTION									
Intake of contaminated soil	7 500	7 500	3 500	7 500	3 500	7 500	25 000	700 000	3
Groundwater used for drinking water									
pH < 5.0	250	250	250	250	250	250	250	250	4
pH 5.0 - < 5.5	500	500	500	500	500	500	500	500	4
pH 5.5 - < 6.0	2 000	2 000	2 000	2 000	2 000	2 000	2 000	2 000	4
pH 6.0 - < 6.5	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	4
pH 6.5 - < 7.0	50 000	50 000	50 000	50 000	50 000	50 000	50 000	50 000	4
pH ≥ 7.0	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	4
ENVIRONMENTAL PROTECTION									
Toxicity to soil invertebrates and plants	85	150	150	150	150	300	300	300	
Livestock ingesting soil and fodder			150						
Major microbial functional impairment			350						5
Groundwater flow to surface water used by aquatic life									
Freshwater									
pH < 5.5	75	75	75	75	75	75	75	75	4,6,7
pH 5.5 - < 6.0	100	100	100	100	100	100	100	100	4,7
pH 6.0 - < 6.5	700	700	700	700	700	700	700	700	4,7
pH 6.5 - < 7.0	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	4,7

Toxicity to Inverts.
And Plants 300 µg/g

AWF (@pH 6.4)
700 µg/g

Relief Qualifiers

- Constrained by minimum mandatory CSR Standard
  - GPM > CSR mandatory Std
- Not constrained by minimum mandatory CSR Standard

  GPM < CSR mandatory Std

Summary Relief Ranges

GPM result that exceeds the BC CSR Standard but exceeds the minimum mandatory standard
GPM result that exceeds the BC CSR Standard but does not exceed the minimum mandatory standard

PCOC Overviews

N = No Relief
GPM relief but limited by mandatory factors: t=toxicity to invertebrates and plants; i=intake of contaminated soil; L=livestock injestion; M=microbial function
Y = GPM Relief

2-Parameter Matrices

No Relief	**Relief, but GPM result less than Regional Bakground**
Potential Relief - Constrained by Mandatory Tox/Intake Standard	**Relief!**

Using the Tools

- Info/Instruction
- Summary / Index
- Backup

Link

Link

Instructions | Acronyms | INFO. Summary Look-Up Tables | INFO. PCOC Overview Tables | INFO. 2-Parameter Matrix Tables | Summary Look-Up Table | PCOC Overview Index | 2-Parameter Matrix Index | CL_As_DW | CL_As_AWF | CL_As_A ....

Link to Summary Look-Up Table

Link to PCOC Overview Index

Link to 2-Parameter Matrix Index

Link to Instructions

Link to Sheet
foc-Infilt_Bz
foc-Infilt_DIPA
foc-Infilt_EBz
foc-Infilt_EGly
foc-Infilt_Me
foc-Infilt_Naph
foc-Infilt_NNE

Link to Index

• Using the Tools
Summary Lookup Table

Table of Groundwater Protection Model (GPM) Parameter Ranges where GPM Results are Greater than BC CSR Schedule 3.1 Part 1

Link to Instructions

Parameter →
Abbreviation →

Land Use	PCOC	Groundwater Use	Link to Sheet	GPM Parameter Relief Ranges											
				Infiltration Rate (m/yr)		Fraction of Organic Carbon (-)		Distance to Point of Compliance (m)		Depth from Source to Water Table (m)		Average Linear Groundwater Velocity (m/yr)		pH of Soil (-)	
				I		foc		x		b		v		pHsoil	
				lower	upper	lower	upper	lower	upper	lower	upper	lower	upper	lower	upper
CL	Arsenic	DW	CL_As_DW	0.08	0.1	no relief	no relief	500	500	no relief	no relief	200	250	no relief	no relief
CL	Arsenic	AWF	CL_As_AWF	0.08	0.1	no relief	no relief	500	500	no relief	no relief	200	250	no relief	no relief
CL	Arsenic	AWM	CL_As_AWM	0.08	0.45	no relief	no relief	60	500	no relief	no relief	50	250	8	9
CL	Barium	DW	CL_Ba_DW	0.08	0.4	no relief	no relief	80	500	no relief	no relief	50	250	no relief	no relief
CL	Barium	AWF	CL_Ba_AWF	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief
CL	Barium	AWM	CL_Ba_AWM	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief
CL	Benzene	DW	CL_Bz_DW	0.08	0.4	0.01	0.05	20	500	0.5	3.5	5	250	no relief	no relief
CL	Benzene	AWF	CL_Bz_AWF	0.08	0.5	0.01	0.05	20	500	0.5	3.5	5	250	no relief	no relief
CL	Benzene	AWM	CL_Bz_AWM	0.08	0.5	0.01	0.05	20	500	0.5	3.5	5	250	no relief	no relief
CL	Beryllium	DW	CL_Be_DW	0.08	0.08	no relief	no relief	500	500	no relief	no relief	200	250	no relief	no relief
CL	Beryllium	AWF	CL_Be_AWF	0.08	0.08	no relief	no relief	500	500	no relief	no relief	200	250	no relief	no relief
CL	Beryllium	AWM	CL_Be_AWM	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief	no relief
CL	Cadmium	DW	CL_Cd_DW	0.08	0.2	no relief	no relief	200	500	no relief	no relief	100	250	no relief	no relief
CL	Cadmium	AWF	CL_Cd_AWF	0.08	0.1	no relief	no relief	200	500	no relief	no relief	150	250	no relief	no relief
CL	Cadmium	AWM	CL_Cd_AWM	0.08	0.2	no relief	no relief	200	500	no relief	no relief	100	250	no relief	no relief

• Using the Tools

Summary Lookup Backup Sheets

Link to Index

Land Use: →	CL
PCOC: →	Toluene
Applicable GW Use: →	DW
Minimum Mandatory Pathway Standard: → (µg/g)	450

Protocol 2 Constraint Note:

											relief lower bound	relief upper bound
I	I	infiltration rate (m/yr)	a	0.08	0.1	0.2	0.3	0.4	0.45	0.5	0.55	0.08	0.5
		CSR Standard (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
		BC GPM (µg/g)		20	20	10	8.5	7.0	6.5	6.5	6.0		
foc	f_{oc}	fraction of organic carbon (-)	b	0.001	0.005	0.01	0.015	0.02	0.03	0.04	0.05	0.01	0.05
		CSR Standard (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
		BC GPM (µg/g)		0.25	6.0	80	600	1500	2000	2500	3000		
x	x	distance to point of compliance (m)	b, c,d	10	20	40	60	80	100	200	500	20	500
		CSR Standard (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
		BC GPM (µg/g)		6.0	60	350	350	350	350	350	350		
b	b	depth from source to water table (m)	b, c	0	0.5	1	1.5	2	2.5	3	3.5	0.5	3.5
		CSR Standard (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
		BC GPM (µg/g)		6.0	350	350	350	350	350	350	350		
v	v	average linear groundwater velocity (m/yr)	b	5	10	30.27	50	100	150	200	250	5	10
		CSR Standard (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
		BC GPM (µg/g)		350	250	6	3	2	2	1.5	1.5		
pH	pH_{soil}	pH of soil (-)	b	5	5.5	6	6.500	7	7.5	8	9		
		CSR Standard (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
		BC GPM (µg/g)		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		

• Using the Tools
PCOC Overview Index

Overview Sheets Showing Where a Specific Groundwater Protection Model Parameter Value Gives Relief over CSR Schedule 3.1 Part 1

Link to Instructions

Parameter Setting	Link to Sheet	Count of Relief Instances (out of 204)*
I - infiltration rate = 0.08 m/yr	I-0.08	104
I - infiltration rate = 0.1 m/yr	I-0.1	96
I - infiltration rate = 0.2 m/yr	I-0.2	90
I - infiltration rate = 0.3 m/yr	I-0.3	82
I - infiltration rate = 0.4 m/yr	I-0.4	62
I - infiltration rate = 0.45 m/yr	I-0.45	46
I - infiltration rate = 0.5 m/yr	I-0.5	18
I - infiltration rate = 0.55 m/yr	I-0.55	2
foc - fraction of organic carbon = 0.001	foc-0.001	0
foc - fraction of organic carbon = 0.005	foc-0.005	2
foc - fraction of organic carbon = 0.01	foc-0.01	66

• Using the Tools

PCOC Overview Sheets

Link to Index

GPM Analyte Relief Overview relief count = 38

b - depth from source to water table = 1.5 m

All other GPM parameters set to default value.

Schedule 3.1 PCOC	Comments	Land Use →	CL			IL		
		Groundwater Use →	DW	AWF	AWM	DW	AWF	AWM
Anthracene - no relief	no water use pathways							
Arsenic			N	N	N	N	N	N
Barium			N	N	N	N	N	N
Benzene			Y	Y	Y	Y	Y	Y
Benzo(a)pyrene - no relief	no water use pathways							
Beryllium			N	N	N	N	N	N
Cadmium			N	N	N	N	N	N
Chloride Ion			N	N	N	N	N	N
Chromium (total) - not applicable								
Chromium (VI)			N	N	N	N	N	N
Chromium (III)			N	N	N	N	N	N
Cobalt	adjusted for provincial background		N	N	N	N	N	N
Copper			N	N	N	N	N	N
Cyanide			N	N	N	N	N	N
DDT - no relief	no water use pathways							
DIPA			N	N	N	N	N	N
Ethylbenzene			Y	N	N	Y	N	N
Ethylene Glycol			N	Y	Y	N	Y	Y
Fluoranthene - no relief	no water use pathways							
Lead			N	N	N	N	N	N
Manganese			N	N	N	N	N	N
Mercury - no relief	no water use pathways							
Methanol			Y	N	N	Y	N	N
Molybdenum			N	N	N	N	N	N
Naphthalene			N	N	N	N	N	N
Nickel			N	N	N	N	N	N
Nonylphenol			N	N	N	N	N	N
Pentachlorophenol			Y	Y	Y	Y	Y	Y
PFOS			N	N	N	N	N	N
Phenol			Y	t	t	Y	t	t
PCBs - no relief	no water use pathways							
PCDDs and PCDFs - no relief	no water use pathways							
Selenium			N	N	N	N	N	N
Sodium Ion			N	N	N	N	N	N
Sulfolane			N	N	N	N	N	N
Tetrachloroethylene			N	N	N	N	N	N
Toluene			Y	Y	Y	Y	Y	Y
Trichloroethylene			N	N	N	N	N	N
Uranium			N	N	N	N	N	N
Vanadium			N	N	N	N	N	N
Xylenes			Y	Y	Y	Y	Y	Y
Zinc			N	N	N	N	N	N

Groundwater Uses

Modelled SSS for all applicable water uses

Groundwater used for Drinking Water (DW)		Groundwater flow to surface water used by Aquatic life Freshwater (AWF)		Groundwater flow to surface water used by Aquatic life Marine (AWM)	
CSR Sch 3.1 Part 1	BC GPM	CSR Sch 3.1 Part 1	BC GPM	CSR Sch 3.1 Part 1	BC GPM
10	10	**10**	10	**10**	10
350	350	**3500**	3500	**1500**	1500
~~0.035~~	**1**	~~2.5~~	**90**	~~6.5~~	**250**
20	7.5	**4**	1.5	**2500**	950
1	1.0	**1**	1.0	**3.5**	2.5
100	100	**600**	600		
60	60	**60**	60	**60**	60
1000000	1000000	**300000**	300000	**1000000**	1000000
25	25	**25**	25	**25**	25
50000	25000	**3000**	1500	**650**	350
6.5	6.5	**1.5**	1.5	**0.35**	0.35
1.5	1.5	**6**	6.0	**6**	6.0
~~15~~	**200**	**200**	200	**200**	200
10	7	~~700~~	**1500**	~~700~~	**1500**
3500	1500	**35000**	20000	**6500**	3500
2000	2000				
~~15~~	**550**				
15	15	**650**	650	**650**	650
100	100	~~75~~	**100**	~~75~~	**100**
70	70	**300**	250	**70**	70
20	20	**4**	4.0	**3**	3.0
~~2.5~~	**30**	~~0.1~~	**30**	~~0.1~~	**30**
0.35	0.35	**9**	9.0	**9**	9.0
~~7.5~~	**200**	~~15~~	**400**	~~15~~	**400**
1	1.0	**1**	1.0	**1**	1.0
15000	15000				
0.1	0.035	**200**	200	**200**	200
		2.5	2.5	**2.5**	2.5
~~6~~	**350**	~~0.5~~	**350**	~~200~~	**350**
		0.3	0.30	**0.3**	0.30
30	30	**150**	150	**150**	150
100	100				
~~6.5~~	**100**	~~20~~	**100**	~~20~~	**100**
600	500	**350**	300	**150**	150

Land Use Mandatory Factors

Mandatory Factors - CL				Mandatory Factors - IL			
Intake of Contaminated Soil (i)	Toxicity to Soil Invertebrates and Plants (t)	minimum		Intake of Contaminated Soil (i)	Toxicity to Soil Invertebrates and Plants (t)	minimum	
150	40	40	t	400	40	40	t
50,000	1,500	1,500	t	1,000,000	1,500	1,500	t
1000	250	250	t	6500	250	250	t
500	350	350	t	15000	350	350	t
150	75	75	t	3500	75	75	t
1,000,000	2,500	2,500	t	1,000,000	2,500	2,500	t
750	250	250	t	20000	250	250	t
750	250	250	t	20000	250	250	t
75	200	75	i	2000	200	200	t
25,000	300	300	t	700,000	300	300	t
150	10	10	t	4000	10	10	t
100000	1000	1000	t	1000000	1000	1000	t
25000	650	650	t	700000	650	650	t
500000	6000	6000	t	1000000	6000	6000	t
150	1000	150	i	4000	1000	1000	t
35000	2000	2000	t	1000000	2000	2000	t
150000	1500	1500	t	1000000	1500	1500	t
1500	150	150	t	35000	150	150	t
5000	20	20	t	150000	20	20	t
3000	250	250	t	80000	250	250	t
1000	15	15	t	35000	15	15	t
550	55	55	t	900	55	55	t
7.5	150	7.5	i	200	150	150	t
75000	200	200	t	1000000	200	200	t
1,500	2	2	t	35,000	2	2	t
1000000	1000	1000	t	1000000	1000	1000	t
2500	500	500	t	70000	500	500	t
1500	30	30	t	40000	30	30	t
20000	450	450	t	550000	450	450	t
150	25	25	t	3500	25	25	t
750	2000	750	i	20000	2000	2000	t
1500	300	300	t	35000	300	300	t
50,000	600	600	t	1,000,000	600	600	t
75000	450	450	t	1000000	450	450	t

• Using the Tools
PCOC Overview Sheets

Link to Index

GPM Analyte Relief Overview

relief count = 38

b - depth from source to water table = 1.5 m

All other GPM parameters set to default value.

Schedule 3.1 PCOC	Comments	Land Use →	CL			IL		
		Groundwater Use →	DW	AWF	AWM	DW	AWF	AWM
Anthracene - no relief	no water use pathways							
Arsenic			N	N	N	N	N	N
Barium			N	N	N	N	N	N
Benzene			Y	Y	Y	Y	Y	Y

• Using the Tools
PCOC Overview Sheets

b - depth from source to water table = 1.5 m

All other GPM parameters set to default value.

Schedule 3.1 PCOC	CL: AWF	Groundwater flow to surface water used by Aquatic life Freshwater (AWF): CSR Sch 3.1 Part 1	Groundwater flow to surface water used by Aquatic life Freshwater (AWF): BC GPM	Mandatory Factors - CL: Intake of Contaminated Soil (i)	Mandatory Factors - CL: Toxicity to Soil Invertebrates and Plants (t)	Mandatory Factors - CL: minimum	
Benzene	Y	~~2.5~~	**250**	1000	250	250	t
Naphthalene	N	~~75~~	**100**	5000	20	20	t
Phenol	t	~~15~~	**400**	75000	200	200	t

• Using the Tools
2-Parameter Matrix Index

2-Parameter Matrices Showing Ranges of Groundwater Protection Model Relief

Link to Instructions

PCOC	GPM Parameter 1	GPM Parameter 2	Link to Sheet	Count of Relief Instances*
Nonylphenols	Infiltration	fraction of organic carbon	foc-Infilt_NNE	948
Pentachlorophenol	Infiltration	fraction of organic carbon	foc-Infilt_PCP	1432
Perfluorooctane Sulfonate	Infiltration	fraction of organic carbon	foc-Infilt_PFOS	924
Phenol	Infiltration	fraction of organic carbon	foc-Infilt_Phen	1420
Sulfolane	Infiltration	fraction of organic carbon	foc-Infilt_Sulf	1224
Tetrachloroethylene	Infiltration	fraction of organic carbon	foc-Infilt_PCE	956
Toluene	Infiltration	fraction of organic carbon	foc-Infilt_Tol	1424
Trichloroethylene	Infiltration	fraction of organic carbon	foc-Infilt_TCE	964
Xylenes, total	Infiltration	fraction of organic carbon	foc-Infilt_Xyl	1428
Arsenic	Infiltration	distance to point of compliance	dPC-Infilt_As	1054
Barium	Infiltration	distance to point of compliance	dPC-Infilt_Ba	630
Benzene	Infiltration	distance to point of compliance	dPC-Infilt_Bz	2000
Beryllium	Infiltration	distance to point of compliance	dPC-Infilt_Be	742
Cadmium	Infiltration	distance to point of compliance	dPC-Infilt_Cd	1604
Chloride Ion	Infiltration	distance to point of compliance	dPC-Infilt_Cl	1266
Chromium, hexavalent	Infiltration	distance to point of compliance	dPC-Infilt_Cr(VI)	10
Chromium, trivalent	Infiltration	distance to point of compliance	dPC-Infilt_Cr(III)	0
Cobalt	Infiltration	distance to point of compliance	dPC-Infilt_Co	400

• Using the Tools

2-Parameter Matrix Sheet

Link to Index

Variables: pH and Infiltration

PCOC: Copper

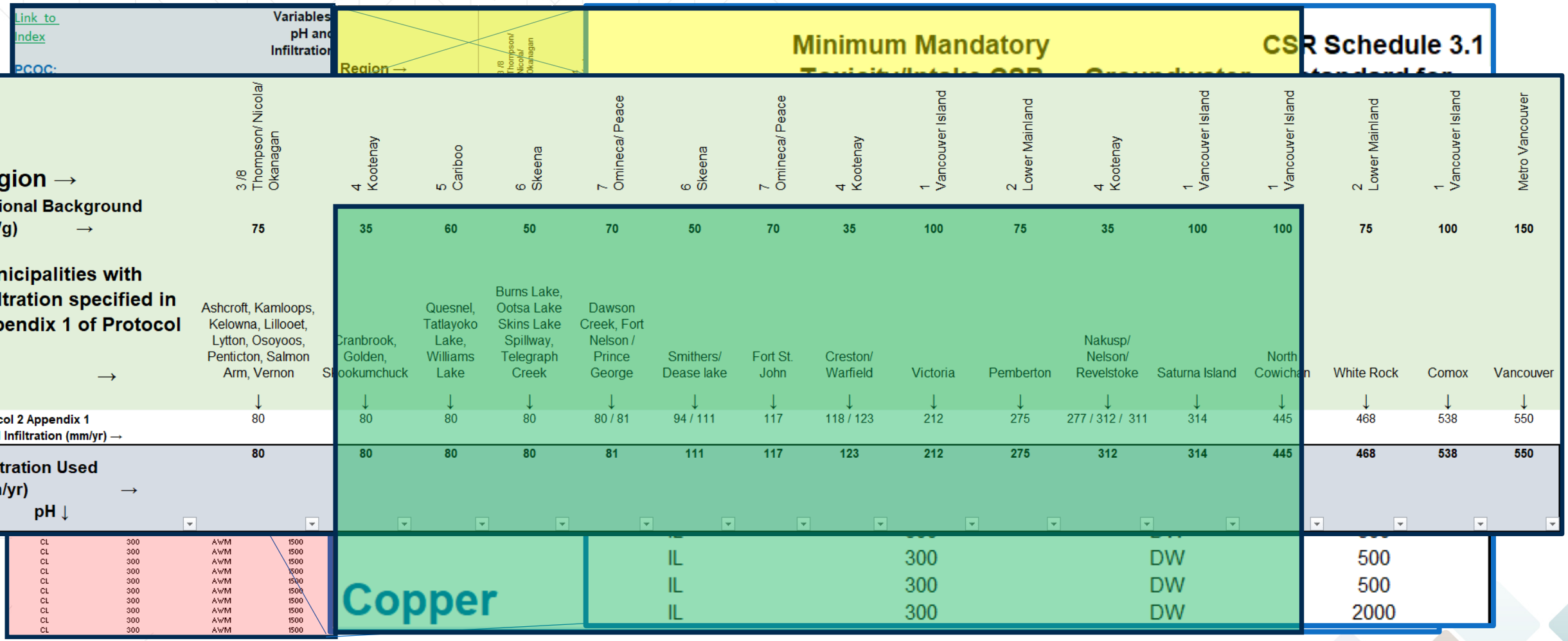
BC GPM Results (µg/g)

No Relief	Relief, but GPM result less than Regional Bakground
Potential Relief – Constrained by Mandatory Tox/Intake Standard	Relief!

Potential Relief and Relief Count: 272

Land use	Minimum Mandatory Toxicity/Intake CSR Schedule 3.1 Standard ↓µg/g	Groundwater Use ↓	CSR Schedule 3.1 standard for Groundwater use ↓µg/g	Region →	3 /8 Thompson/ Nicola/ Okanagan	4 Kootenay	5 Cariboo	6 Skeena	7 Omineca/ Peace	6 Skeena	7 Omineca/ Peace	4 Kootenay	1 Vancouver Island	2 Lower Mainland	4 Kootenay	1 Vancouver Island	1 Vancouver Island	2 Lower Mainland	1 Vancouver Island	Metro Vancouver
				Regional Background (µg/g) →	75	35	60	50	70	50	70	35	100	75	35	100	100	75	100	150
				Municipalities with infiltration specified in Appendix 1 of Protocol 2 →	Ashcroft, Kamloops, Kelowna, Lillooet, Lytton, Osoyoos, Penticton, Salmon Arm, Vernon ↓	Cranbrook, Golden, Skookumchuck ↓	Quesnel, Tatlayoko Lake, Williams Lake ↓	Burns Lake, Ootsa Lake Skins Lake Spillway, Telegraph Creek ↓	Dawson Creek, Fort Nelson / Prince George ↓	Smithers/ Dease lake ↓	Fort St. John ↓	Creston/ Warfield ↓	Victoria ↓	Pemberton ↓	Nakusp/ Nelson/ Revelstoke ↓	Saturna Island ↓	North Cowichan ↓	White Rock ↓	Comox ↓	Vancouver ↓
				Protocol 2 Appendix 1 Listed Infiltration (mm/yr) →	80	80	80	80	80 / 81	94 / 111	117	118 / 123	212	275	277 / 312 / 311	314	445	468	538	550
				Infiltration Used (mm/yr) → pH ↓	80	80	80	80	81	111	117	123	212	275	312	314	445	468	538	550
CL	300	AWF	7500	7.6	25000	25000	25000	25000	25000	20000	20000	20000	15000	10000	10000	10000	8000	8000	7500	7500
CL	300	AWF	7500	7.7	25000	25000	25000	25000	25000	20000	20000	20000	15000	10000	10000	10000	8000	8000	7500	7500
CL	300	AWF	7500	8.0	25000	25000	25000	25000	25000	20000	20000	20000	15000	10000	10000	10000	8000	8000	7500	7500
CL	300	AWF	7500	8.5	25000	25000	25000	25000	25000	20000	20000	20000	15000	10000	10000	10000	8000	8000	7500	7500
CL	300	AWF	7500	9.0	25000	25000	25000	25000	25000	20000	20000	20000	15000	10000	10000	10000	8000	8000	7500	7500
CL	300	AWM	75	5.0	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.1	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.2	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.3	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.4	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.5	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.6	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.7	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.8	95	95	95	95	95	75	75	75	75	75	75	75	75	75	75	75
CL	300	AWM	75	5.9	150	150	150	150	150	100	95	95	75	75	75	75	75	75	75	75
CL	300	AWM	150	6.0	200	200	200	200	200	150	150	150	90	75	75	75	75	75	75	75
CL	300	AWM	150	6.1	250	250	250	250	250	200	200	200	150	100	100	100	85	80	75	75
CL	300	AWM	150	6.2	400	400	400	400	400	300	300	250	200	150	150	150	100	100	100	100
CL	300	AWM	150	6.3	550	550	550	550	550	400	400	400	250	250	200	200	150	150	150	150
CL	300	AWM	150	6.4	800	800	800	800	800	600	600	550	400	350	300	300	250	250	250	250
CL	300	AWM	650	6.5	1000	1000	1000	1000	1000	900	850	800	550	450	450	450	350	350	350	350
CL	300	AWM	650	6.6	1500	1500	1500	1500	1500	1000	1000	1000	700	600	550	550	450	450	400	400
CL	300	AWM	650	6.7	2000	2000	2000	2000	2000	1500	1500	1500	900	750	700	700	600	550	550	550
CL	300	AWM	650	6.8	2500	2500	2500	2500	2500	2000	1500	1500	1000	950	900	850	750	700	650	650
CL	300	AWM	650	6.9	3000	3000	3000	3000	3000	2000	2000	2000	1500	1000	1000	1000	900	900	850	850
CL	300	AWM	1500	7.0	3500	3500	3500	3500	3500	3000	2500	2500	2000	1500	1500	1500	1000	1000	1000	1000
CL	300	AWM	1500	7.1	4000	4000	4000	4000	4000	3000	3000	3000	2000	1500	1500	1500	1500	1500	1000	1000
CL	300	AWM	1500	7.2	4500	4500	4500	4500	4500	3500	3500	3500	2000	2000	2000	1500	1500	1500	1500	1500
CL	300	AWM	1500	7.3	5000	5000	5000	5000	5000	4000	4000	3500	2500	2000	2000	2000	1500	1500	1500	1500
CL	300	AWM	1500	7.4	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500
CL	300	AWM	1500	7.5	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500
CL	300	AWM	1500	7.6	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500
CL	300	AWM	1500	7.7	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500
CL	300	AWM	1500	8.0	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500
CL	300	AWM	1500	8.5	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500
CL	300	AWM	1500	9.0	5500	5500	5500	5500	5500	4500	4000	4000	3000	2500	2000	2000	2000	2000	1500	1500

• Using the Tools
2-Parameter Matrix Sheet



• Using the Tools
2-Parameter Matrix Sheet

PCOC:

Copper

Land use	Minimum Mandatory Toxicity/Intake CSR Schedule 3.1 Standard	Groundwater Use	CSR Schedule 3.1 standard for Groundwater use
	µg/g		µg/g
CL	300	AWF	75
CL	300	AWF	75
CL	300	AWF	75
CL	300	AWF	100
CL	300	AWF	100
CL	300	AWF	100
CL	300	AWF	100
CL	300	AWF	100
CL	300	AWF	700

Region →

Regional Background (µg/g) →

→

6 Skeena
50
Smithers/ Dease lake
↓
94 / 111

Protocol 2 Appendix 1 Listed Infiltration (mm/yr) →

111

Infiltration Used (mm/yr) →

pH ↓

5.2	75
5.3	80
5.4	100
5.5	150
5.6	150
5.7	250
5.8	350
5.9	450
6.0	650

• Using the Tools
2-Parameter Matrix Sheet

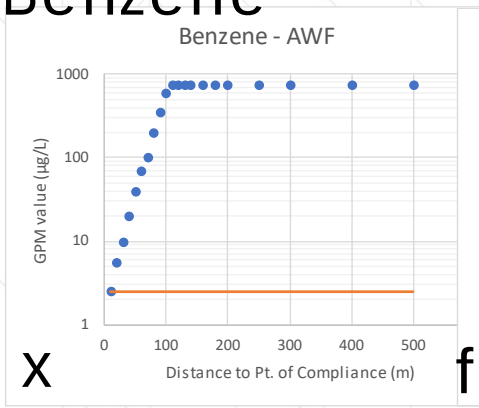
PCOC:

Vanadium

Land use	Minimum Mandatory Toxicity/Intake CSR Schedule 3.1 Standard	Groundwater Use	CSR Schedule 3.1 standard for Groundwater use	Region →	1 Vancouver Island
				Regional Background (µg/g) →	200 Victoria
				→	↓
				Protocol 2 Appendix 1 Listed Infiltration (mm/yr) →	212
				Infiltration Used (mm/yr) →	212
↓	↓µg/g	↓	↓µg/g	Groundwater Velocity ↓ (m/yr)	
CL	300	DW	100	13	100
CL	300	DW	100	15	100
CL	300	DW	100	20	100
CL	300	DW	100	30	100
CL	300	DW	100	40	150
CL	300	DW	100	50	150
CL	300	DW	100	100	300
CL	300	DW	100	150	400
CL	300	DW	100	200	500

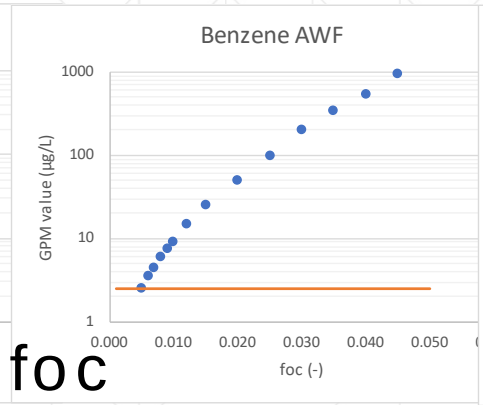
Relative Effects

Benzene



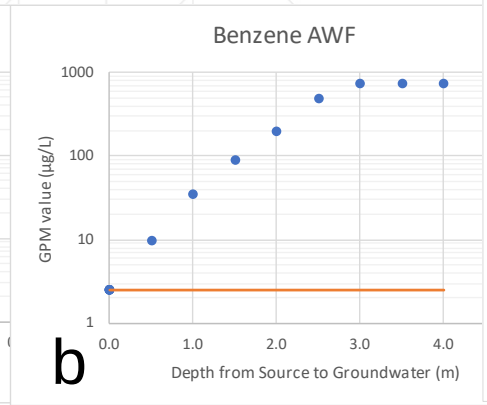
x

- Bio-attenuation
- Dispersion



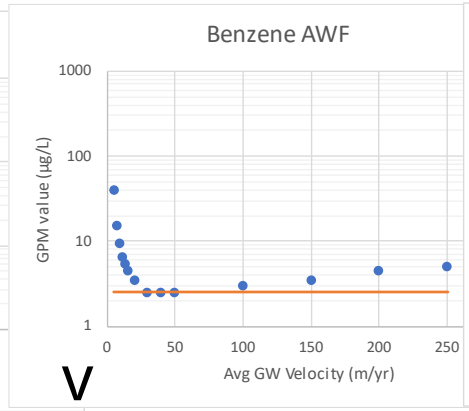
foc

- Leachate Partitioning
- Retardation



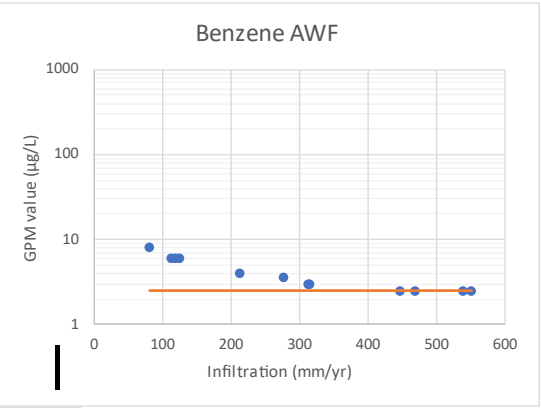
b

- Bio-attenuation



v

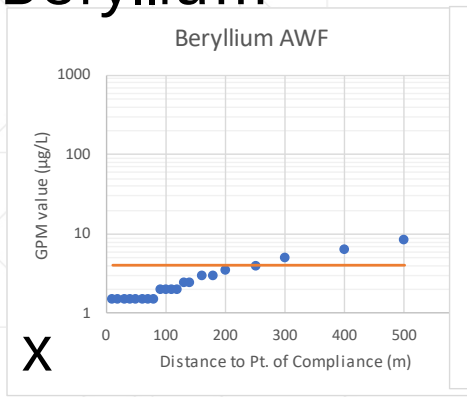
- Bio-attenuation
- Dispersion
- Dilution



I

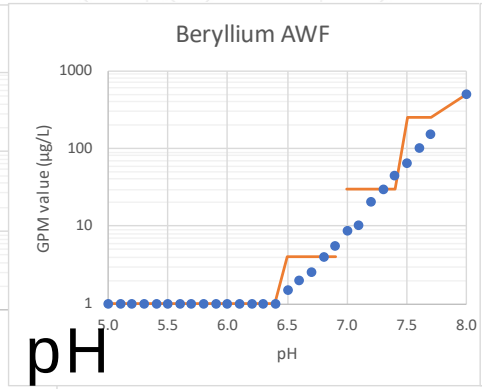
- Bio-attenuation
- Dilution

Beryllium



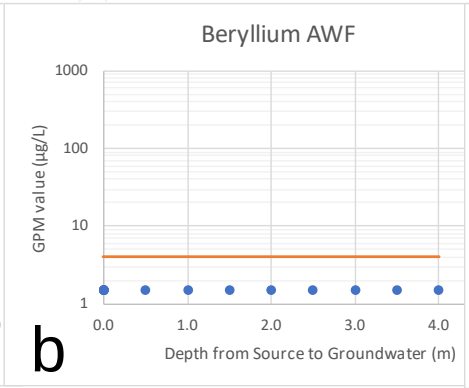
x

- Dispersion



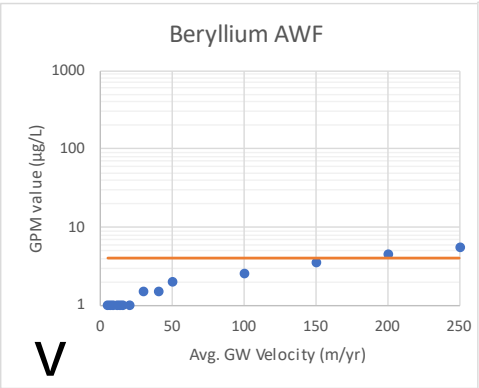
pH

- Leachate Partitioning
- Retardation



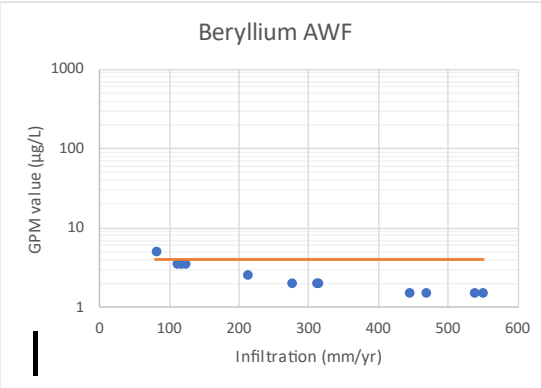
b

- No effect



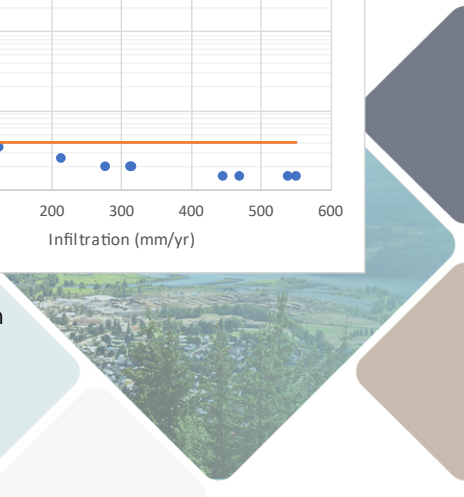
v

- Dispersion
- Dilution



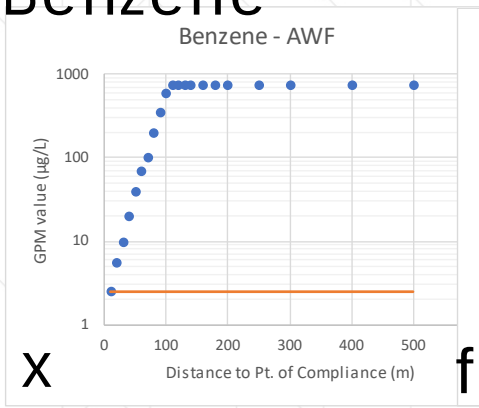
I

- Dilution



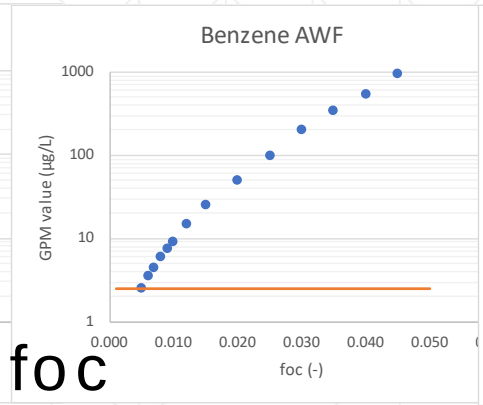
Relative Effects - Organics

Benzene



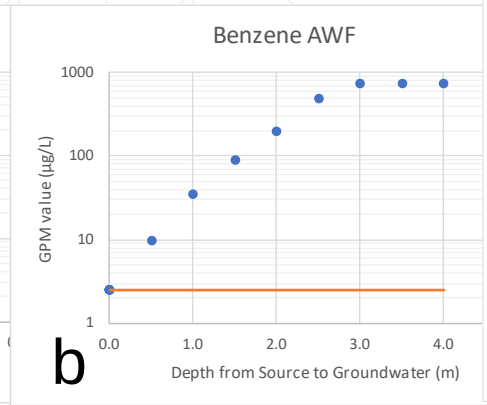
x

- Bio-attenuation
- Dispersion



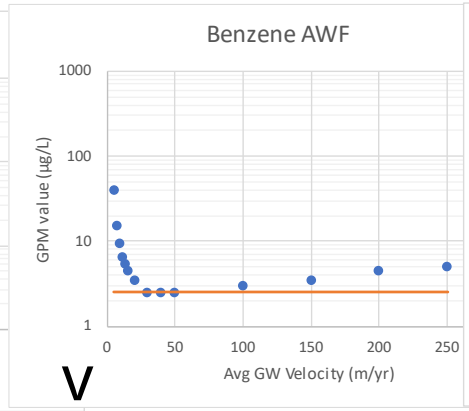
foc

- Leachate Partitioning
- Retardation



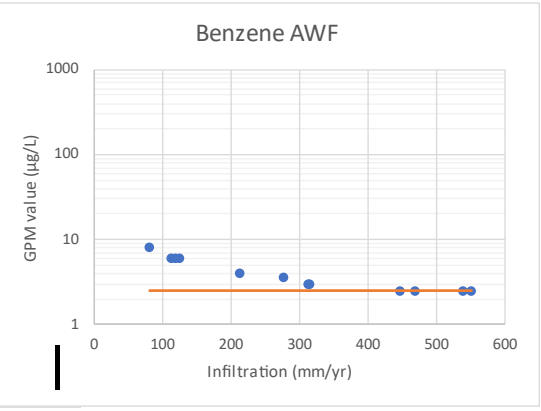
b

- Bio-attenuation



v

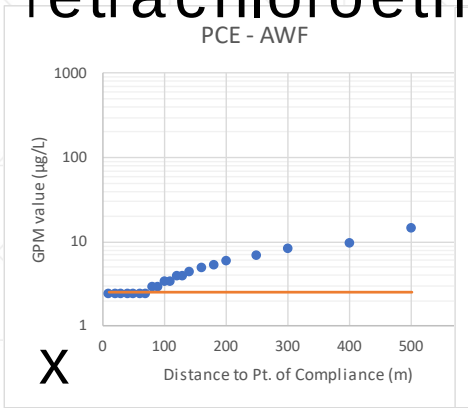
- Bio-attenuation
- Dispersion
- Dilution



l

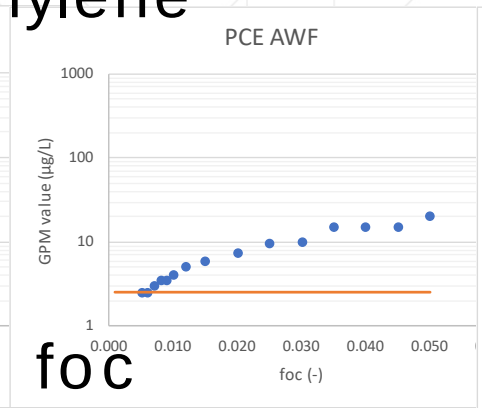
- Bio-attenuation
- Dilution

Tetrachloroethylene



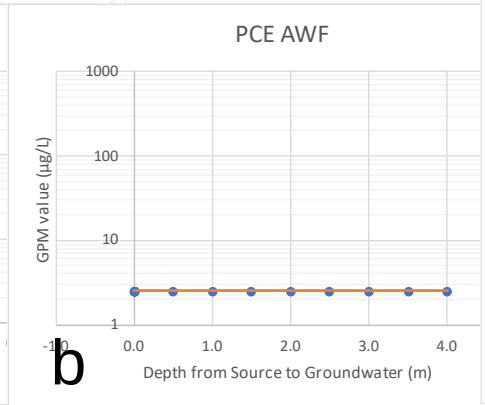
x

- Dispersion



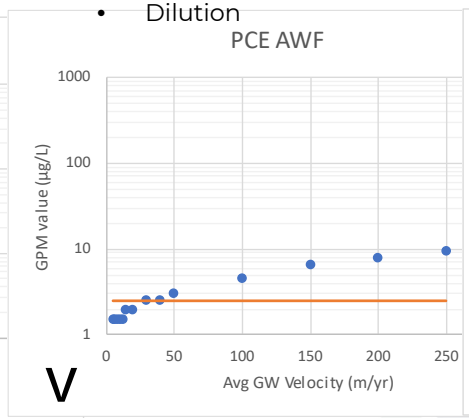
foc

- Leachate Partitioning
- Retardation



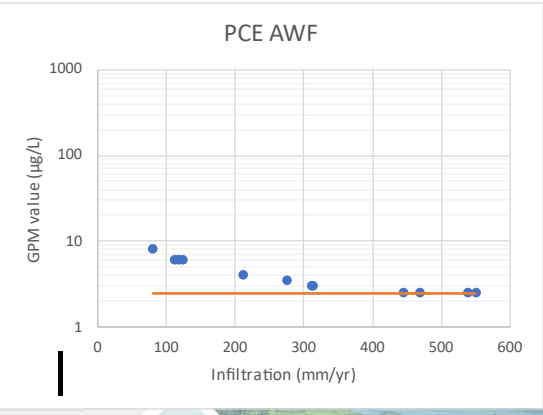
b

- No effect



v

- Dispersion
- Dilution

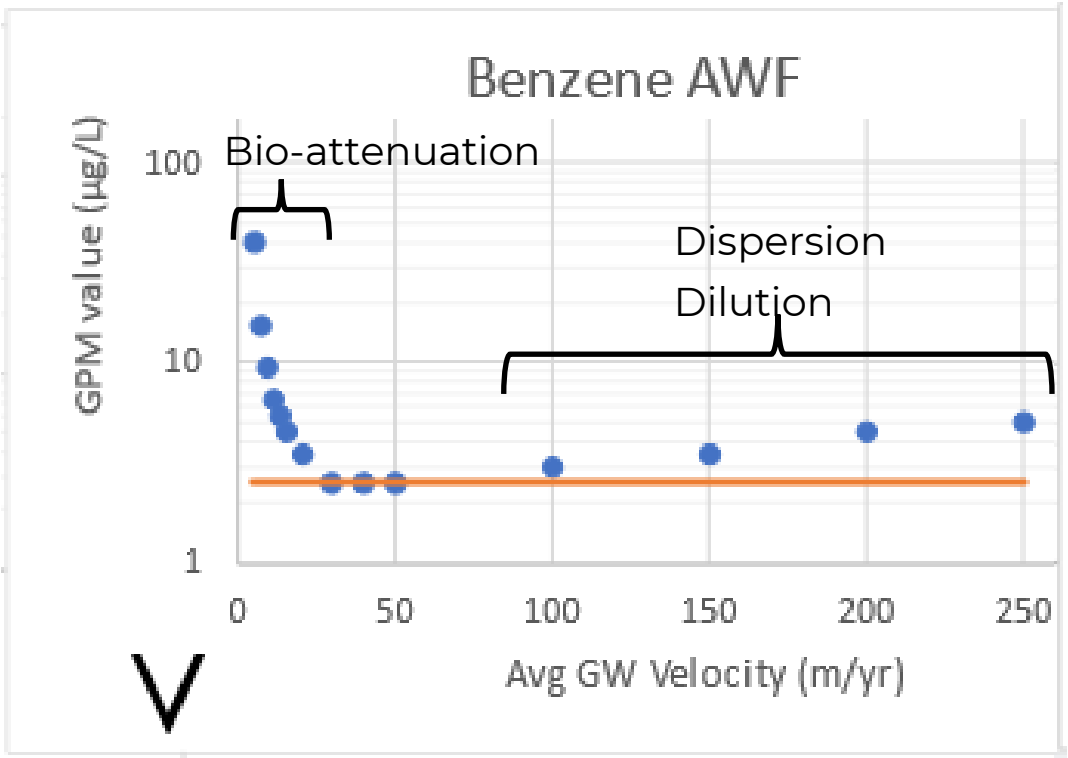


l

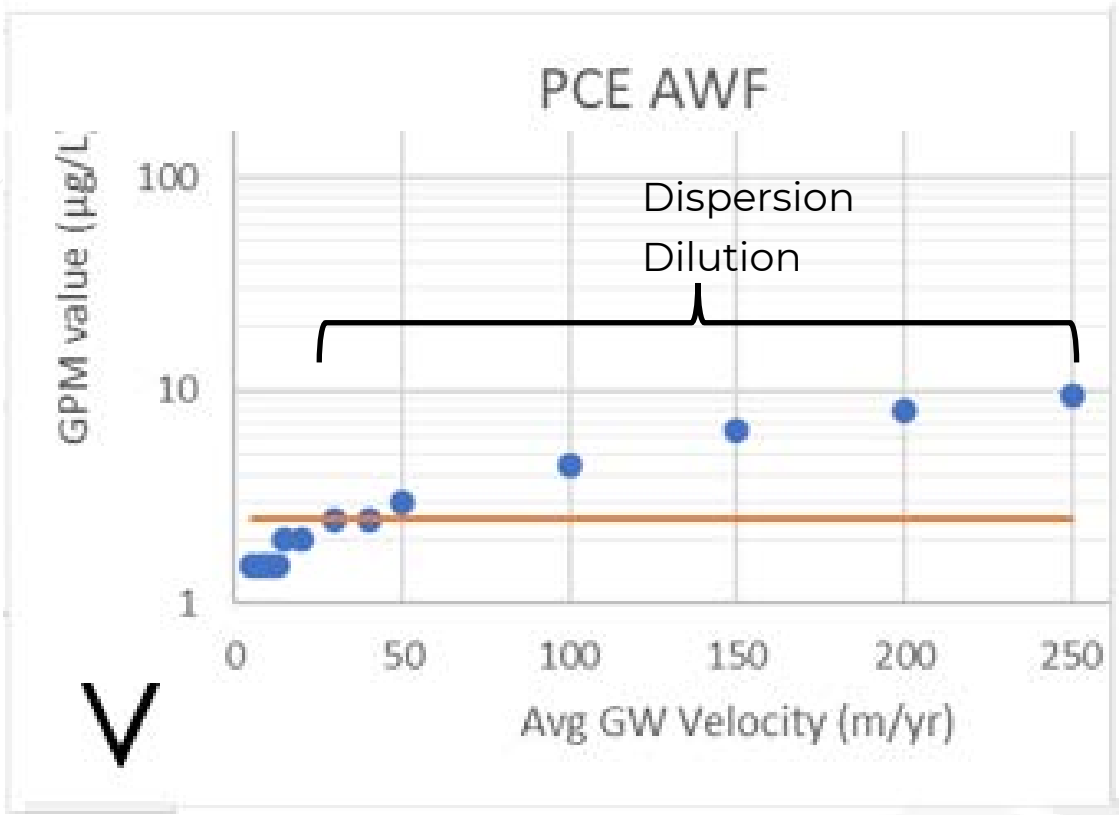
- Dilution

Relative Effects - Organics

Benzene

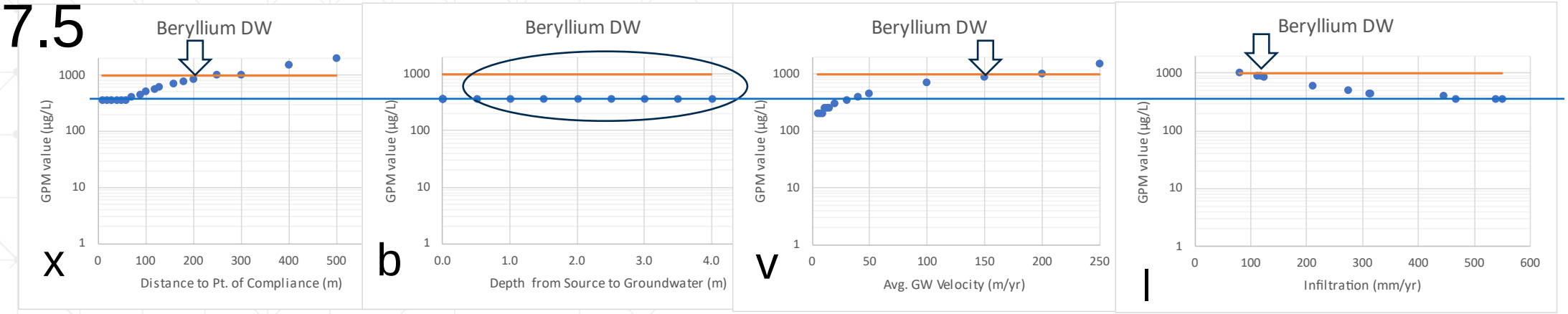


Tetrachloroethylene

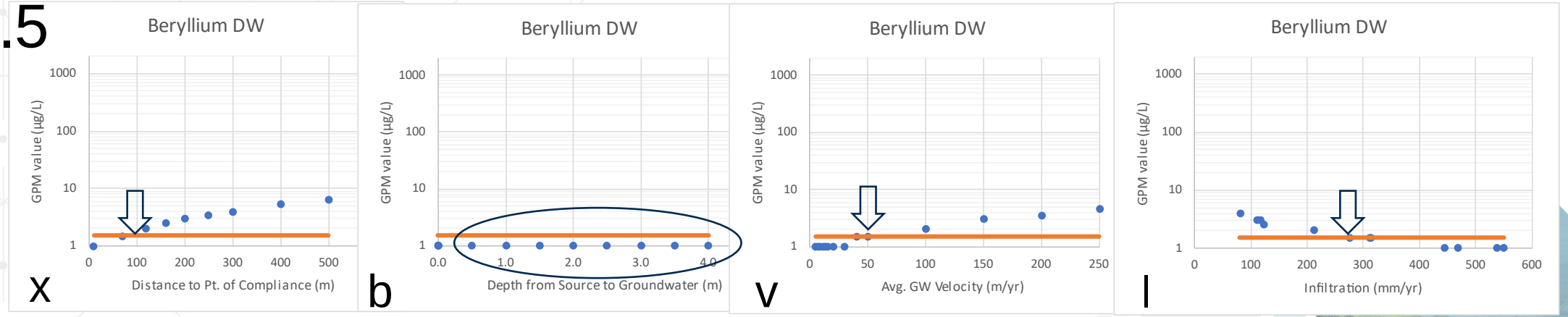


Relative Effects – pH

pH = 7.5



pH = 5.5



Top 5 substances for P2 SSS

2-Parameter Matrices Showing Ranges of Groundwater Protection Model Relief

Link to Instructions

PCOC	GPM Parameter 1	GPM Parameter 2	Link to Sheet	Count of Relief Instances*
Benzene	Infiltration	fraction of organic carbon	foc-Infilt_Bz	1424
Benzene	Infiltration	distance to point of compliance	dPC-Infilt_Bz	2000
Benzene	Infiltration	depth from source to water table	dGW-Infilt_Bz	1168
Benzene	Infiltration	average groundwater velocity	vGW-Infilt_Bz	1282

Top 5 substances for P2 SSS

Organics				
Rank	PCOC	Relief Count*	Out of	Relief %
1	**Benzene**	**5874**	**6144**	**95.6%**
2	**Pentachlorophenol**	**5864**	**6144**	**95.4%**
3	**Phenol**	**5836**	**6144**	**95.0%**
4	**Xylenes**	**5682**	**6144**	**92.5%**
5	**Toluene**	**5588**	**6144**	**91.0%**
6	Methanol	1846	2048	90.1%
7	Diisopropanolamine (DIPA)	5368	6144	87.4%
8	Trichloroethylene	3456	4096	84.4%
9	Tetrachloroethylene	3428	4096	83.7%
10	Ethylene Glycol	4976	6144	81.0%
11	Sulfolane	4106	6144	66.8%
12	Nonylphenols	3558	6144	57.9%
13	Ethylbenzene	2754	5024	54.8%
14	Perfluorooctane Sulfonate	2270	6144	36.9%
15	Naphthalene	0	5632	0.0%

Inorganics				
Rank	PCOC	Relief Count*	Out of	Relief %
1	**Cyanide**	**6538**	**7584**	**86.2%**
2	**Chloride Ion**	**4172**	**5392**	**77.4%**
3	**Uranium**	**5564**	**7584**	**73.4%**
4	**Cadmium**	**4516**	**7584**	**59.5%**
5	**Vanadium**	**1342**	**2528**	**53.1%**
6	Arsenic	3180	6688	47.5%
7	Beryllium	2352	7584	31.0%
8	Molybdenum	2214	7584	29.2%
9	Zinc	2016	7584	26.6%
10	Barium	1984	7584	26.2%
11	Nickel	984	7584	13.0%
12	Cobalt	588	7584	7.8%
13	Selenium	202	5104	4.0%
14	Lead	277	7584	3.7%
15	Copper	272	7584	3.6%
16	Chromium, hexavalent	30	7584	0.4%
17	Chromium, trivalent	0	7584	0.0%
18	Manganese	0	2528	0.0%
19	Sodium Ion	0	2528	0.0%

*** Relief count summed from 2-Parameter CL/IL matrices**

Example Scenario #1 – Benzene DW

- CL Site in Kamloops -> I = 80 mm/yr
- Soil is silty sand -> v = 40 m/yr, foc = 0.002
- Groundwater is deep -> d = 10 m, but Z = 10 m => b = 0 m

I	infiltration rate (m/yr)	a	**0.08**	**0.1**	**0.2**	**0.3**	**0.4**	0.45	0.5	0.55
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		**0.10**	**0.095**	**0.060**	**0.045**	**0.040**	0.035	0.035	0.035
f_{oc}	fraction of organic carbon (-)	b	0.001	0.005	**0.01**	**0.015**	**0.02**	**0.03**	**0.04**	**0.05**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		0.006	0.035	**0.10**	**0.30**	**0.65**	**2.5**	**7.0**	**20**
x	distance to point of compliance (m)	b,c,d	10	**20**	**40**	**60**	**80**	**100**	**200**	**500**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		0.035	**0.070**	**0.25**	**0.85**	**2.5**	**7.5**	**550**	**750**
b	depth from source to water table (m)	b,c	0	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		0.035	**0.2**	**0.5**	**1.0**	**3.0**	**6.5**	**15**	**25**
v	average linear groundwater velocity (m/yr)	b	5	**10**	30.27	50	100	**150**	**200**	**250**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		**0.45**	**0.10**	0.035	0.030	0.035	**0.045**	**0.055**	**0.060**

Example Scenario #1 – Benzene DW

- CL Site in Kamloops -> I = 80 mm/yr
- Soil is silty sand -> v = 40 m/yr, foc = 0.002
- Groundwater is deep -> d = 10 m

Z = 10 m => b = 0 m

I	infiltration rate (m/yr)	a	**0.08**	**0.1**	**0.2**	**0.3**	**0.4**	0.45	0.5	0.55
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		**0.10**	**0.095**	**0.060**	**0.045**	**0.040**	0.035	0.035	0.035
f_{oc}	fraction of organic carbon (-)	b	0.001	0.005	**0.01**	**0.015**	**0.02**	**0.03**	**0.04**	**0.05**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		0.006	0.035	**0.10**	**0.30**	**0.65**	**2.5**	**7.0**	**20**
x	distance to point of compliance (m)	b,c,d	10	**20**	**40**	**60**	**80**	**100**	**200**	**500**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		0.035	**0.070**	**0.25**	**0.85**	**2.5**	**7.5**	**550**	**750**
b	depth from source to water table (m)	b,c	0	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		0.035	**0.2**	**0.5**	**1.0**	**3.0**	**6.5**	**15**	**25**
v	average linear groundwater velocity (m/yr)	b	5	**10**	30.27	50	100	**150**	**200**	**250**
	CSR Standard		0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	BC GPM		**0.45**	**0.10**	0.035	0.030	0.035	**0.045**	**0.055**	**0.060**

Example Scenario #2 – Uranium DW

Municipalities with infiltration specified in Appendix 1 of Protocol 2 →	Ashcroft, Kamloops, Kelowna, Lillooet, Lytton, Osoyoos, Penticton, Salmon Arm, Vernon	Cranbrook, Golden, Skookumchuck	Quesnel, Tatlayoko Lake, Williams Lake	Burns Lake, Ootsa Lake Skins Lake Spillway, Telegraph Creek	Dawson Creek, Fort Nelson / Prince George	Smithers/ Dease lake	Fort St. John	Creston/ Warfield
Protocol 2 Appendix 1 Listed Infiltration (mm/yr) →	80	80	80	80	80 / 81	94 / 111	117	118 / 123
Infiltration Used (mm/yr) → Groundwater Velocity ↓ (m/yr)	**80**	**80**	**80**	**80**	**81**	**111**	**117**	**123**
5	30	30	30	30	30	25	25	25
7	35	35	35	35	35	30	30	30
9	45	45	45	45	45	35	35	35
11	50	50	50	50	50	40	40	40
13	55	55	55	55	55	45	45	40
15	60	60	60	60	60	50	45	45
20	75	75	75	75	75	60	55	55
30	[illegible]	100	100	100	100	80	75	75
40	150	150	150	150	150	100	95	90
50	[illegible]	150	150	150	150	100	100	100
100	300	300	300	300	300	200	200	200

Example Scenario #3 – Benzene DW

- IL Site in Fort St John -> I = 80 mm/yr
- Soil is clay till -> v = 3 m/yr, foc = 0.01

I	infiltration rate (m/yr)	a	**0.08**	**0.1**	**0.2**	**0.3**
	CSR Standard		0.035	0.035	0.035	0.035
	BC GPM		**0.10**	**0.095**	**0.060**	**0.045**
f_{oc}	fraction of organic carbon (-)	b	0.001	0.005	**0.01**	**0.015**
	CSR Standard		0.035	0.035	0.035	0.035
	BC GPM		0.006	0.035	**0.10**	**0.30**
x	distance to point of compliance (m)	b,c,d	10	**20**	**40**	**60**
	CSR Standard		0.035	0.035	0.035	0.035
	BC GPM		0.035	**0.070**	**0.25**	**0.85**
b	depth from source to water table (m)	b,c	0	**0.5**	**1**	**1.5**
	CSR Standard		0.035	0.035	0.035	0.035
	BC GPM		0.035	**0.2**	**0.5**	**1.0**
v	average linear groundwater velocity (m/yr)	b	5	**10**	30.27	50
	CSR Standard		0.035	0.035	0.035	0.035
	BC GPM		**0.45**	**0.10**	0.035	0.030

µg/g

Example Scenario #4 – Toluene AWF

- CL Site in Delta -> I = 550 mm/yr
- Soil is silty peat -> v = 10 m/yr, foc = 0.4
  - *What if our CSM indicated foc of a different soil unit was more appropriate? Sand and Gravel unit foc = 0.006*

I	infiltration rate (m/yr)	a	**0.08**	**0.1**	**0.2**	**0.3**	**0.4**	**0.45**	**0.5**	0.55
	CSR Standard		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	BC GPM		**2.0**	**1.5**	**0.90**	**0.70**	**0.60**	**0.55**	**0.55**	0.50
f_{oc}	fraction of organic carbon (-)	b	0.001	0.005	**0.01**	**0.015**	**0.02**	**0.03**	**0.04**	**0.05**
	CSR Standard		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	BC GPM		0.020	0.50	**7.0**	**50**	**300**	**2000**	**2500**	**3000**
x	distance to point of compliance (m)	b,c,d	10	**20**	**40**	**60**	**80**	**100**	**200**	**500**
	CSR Standard		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	BC GPM		0.50	**5.0**	**150**	**350**	**350**	**350**	**350**	**350**
b	depth from source to water table (m)	b,c	0	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**3.5**
	CSR Standard		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	BC GPM		0.50	**75**	**350**	**350**	**350**	**350**	**350**	**350**
v	average linear groundwater velocity (m/yr)	b	5	**10**	30.27	50	100	150	200	250
	CSR Standard		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	BC GPM		**350**	**20**	0.5	0.2	0.2	0.10	0.15	0.15

Read the Requirements Carefully!

- Groundwater must be assessed
- Input ranges are prescribed
- SSS cannot be derived for PHC on sites where mobile NAPL is present
- Some inputs require “linked” parameters to be modified
- Some substances require site-specific inputs to be used for any modifications:
  - pH-dependent substances – require site-specific soil pH
  - PCP (AW) - requires site-specific soil pH and groundwater pH
  - AW standards for hardness-dependent substances - require site-specific receiving water hardness

Areas for Further Study

- Defensible approaches for development of site-specific pH, foc, velocity?
- How detailed a CSM do you need to have established prior to attempting to develop SSS?
- Cherry-picking?
  - Different modifications for different substances at the same site
  - Ignoring potential modifications that would reduce the SSS
  - Nothing in P2 to indicate you need to modify a minimum number of inputs based on your CSM, but is this good practice?

THANK YOU

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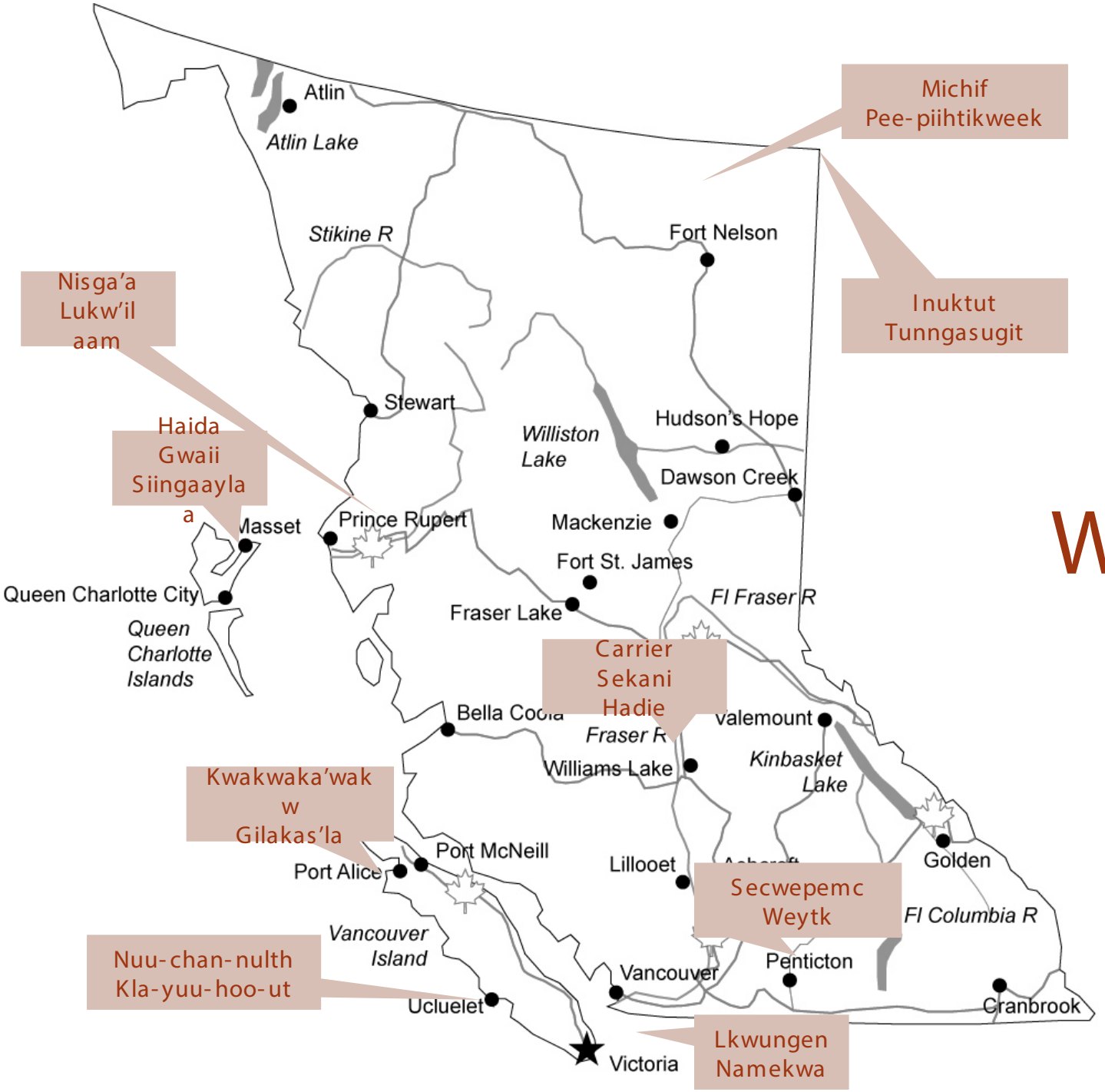
ibiniowsky@slrconsulting.com

CSAP

Indigenous Community Engagement Workshop


Atlin
Atlin Lake
Stikine R
Fort Nelson
Michif Pee-piihtikweek
Inuktut Tunngasugit
Nisga'a Lukw'il aam
Stewart
Haida Gwaii Siingaaylaa
Williston Lake
Hudson's Hope
Dawson Creek
Masset
Prince Rupert
Mackenzie
Fort St. James
Queen Charlotte City
Queen Charlotte Islands
Fraser Lake
Fl Fraser R
Carrier Sekani Hadie
Bella Coola
Valemount
Fraser R
Williams Lake
Kinbasket Lake
Kwakwaka'wakw Gilakas'la
Port McNeill
Port Alice
Lillooet
Golden
Secwepemc Weytk
Fl Columbia R
Vancouver Island
Nuu-chan-nulth Kla-yuu-hoo-ut
Vancouver
Penticton
Ucluelet
Cranbrook
Victoria
Lkwungen Namekwa

Welcome!

INDIGENOUS COMMUNITY FOR LEADERSHIP AND DEVELOPMENT

Indigenous owned organization

- Extensive experience working with Indigenous Communities across BC. (90 nations), Public and Private Organizations.
- Since 2017, when British Columbia adopted the United Nations Declaration on the Rights of Indigenous People (UNDRIP) and the Truth and Reconciliation Commissions 94 Calls to Action, it has been our mission to support Indigenous and Non-Indigenous organizations to work collaboratively toward reconciliation.
- We work within Frameworks of Cultural Safety and Competency and provide a wide spectrum of training, research, consultation, facilitation and change management.
- We want our next generations to have better lives than us and our ancestors

The Significance of Recognizing Traditional Keepers of the Land

Acknowledging Indigenous communities as the traditional custodians of this land is a vital step towards reconciliation, mutual respect, and understanding.

- **Honoring Centuries of Stewardship:**

Indigenous communities have maintained an enduring connection to these lands, protecting and nurturing them for countless generations.

- **Respecting Culture and Heritage:**

By recognizing their custodianship, we show respect for the rich cultures, languages, and traditions that are deeply intertwined with the land.

- **Fostering Mutual Respect:**

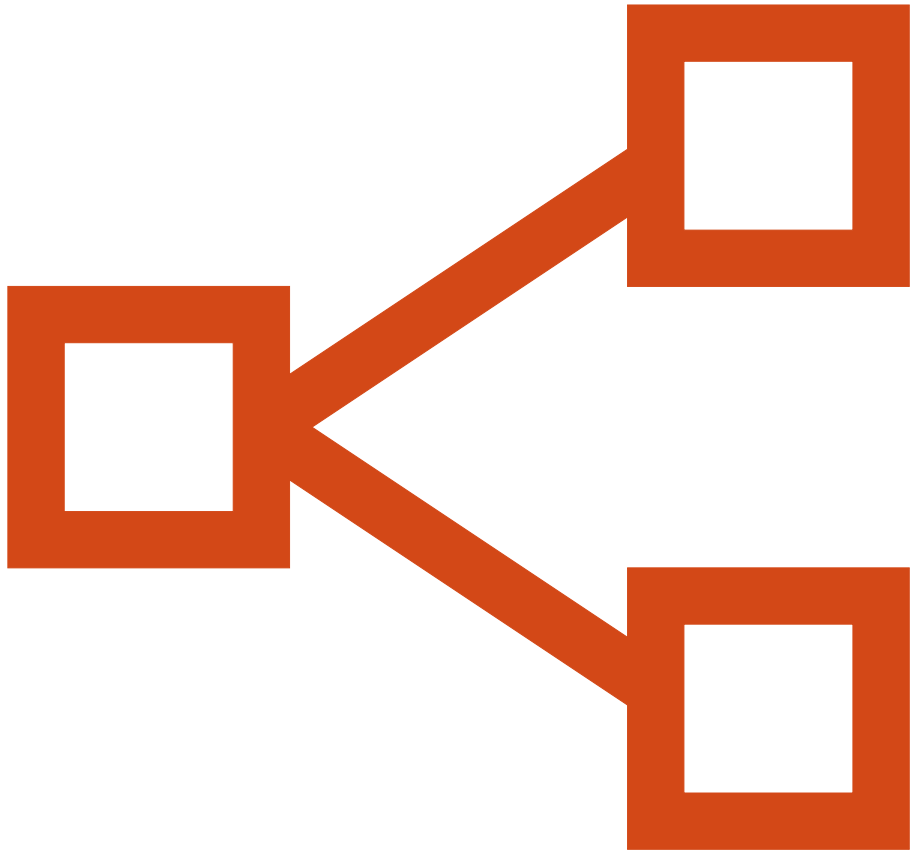
This acknowledgment is a powerful symbol of our commitment to working together, fostering trust, and creating meaningful partnerships.

- **A Shared Journey:**

It Is an open invitation for all of us to partake in the shared journey of understanding, learning from, and celebrating the Indigenous cultures that contribute to the uniqueness of this place.

Building Genuine Relationships

- As we bridge the dialogue between companies and communities, our role is to foster mutual respect, understanding, and lasting relationships
- In today's session, we'll provide insights into initiating in-person meetings, introducing ourselves through an Indigenized lens, and nurturing relationships based on reciprocity.
- Authentic relationships go beyond business transactions; they are built on trust, shared goals, and a commitment to respecting one another's perspectives.



Introductions

1. Begin with Land Acknowledgment:

It is a good idea to start meetings by acknowledging the traditional lands of the Indigenous community you are engaging with. Express appreciation for their stewardship of the land, which sets a respectful tone for the interaction.

1. Cultural Greeting:

Consider including a cultural greeting or a welcoming phrase in the local Indigenous language. If you're not familiar with the language, seek guidance from local community members to ensure your greeting is culturally appropriate.

1. Meet In Person Whenever Possible:

Whenever your schedule allows, aim to meet in person. Face-to-face interactions build trust and convey your commitment to the relationship. If an in-person meeting isn't feasible, opt for virtual meetings that facilitate visual connections.

ICLD

First Nations Engagement:

Step 1 – Identification

- Identify First Nations that may have a potential mutual interest
- Initial research for matters of mutual interest.
- How far is the proposed area from existing Indian Reserves or Treaty Lands?
- Are there archaeological sites in the area?
- Has a First Nation previously identified an interest or concerr in the area
- Which First Nations have hunting, fishing, trapping, gathering sites or other traditional use sites within jurisdiction?

Note: traditional use sites may include village or settlement areas, sacred sites or food gathering areas.

First Nations Engagement

Step 2 Engagement

- Describe the specific activity being considered
- Describe the purpose of the change
- Include a map of the proposed subject area;
- Provide details on the process (e.g. proposed timing)
- Ask the First Nation(s) to identify what practices, customs or traditions are engaged in that area, if any whether Indigenous Interests may be adversely
- Hold a face-to-face meeting (if possible)

Step 3 Assessment

Assessment of Engagement includes a report and supporting documents that provide details on engagement efforts.

1. Engagement Report: Create a comprehensive report detailing your engagement activities, discussions, concerns, and agreements with First Nations communities.

2. Supporting Documents: Gather supporting materials such as meeting minutes, emails, and formal agreements to substantiate your engagement report.

3. Efforts Documentation: Document your engagement efforts, including the number of meetings, participants, locations, and follow-up actions.

4. Outcomes and Agreements: Clearly outline any agreements and resolutions resulting from the engagement, along with implementation and monitoring plans.

Other Engagement Tips:

- Differentiate Responsibilities: Respect the roles of the Chief and Council and community departments.
- Key Contacts: Identify community contacts, starting with the CEO or Band Manager.
- Personal Meetings: Schedule face-to-face interactions when possible.
- Transparent Communication: Share project details openly and address challenges.

Additional Tips

Explore **additional strategies** for meaningful engagement with Indigenous communities:

Beyond projects, consider how your HR department can facilitate connections. Reach out to Indigenous bands, introducing yourself as part of the Society of Contaminated Sites Approved Professionals of BC.

Prioritize **in-person meetings** when possible, and let these meetings be more than a discussion of professional duties. Share who you are through an Indigenous lens: your roots, your understanding of the seated territory you call home.

To maintain these relationships, consider gifting if within your budget. This presents symbolize respect and appreciation, and they can go a long way in building trust.

Sustaining ongoing communication is a key priority. Our commitment extends well beyond project timelines, reflecting our dedication to preserving the environment and ancestral lands for future generations. Iterate your goal to promote lasting sustainability and mutual benefit through collaboration with the community.

ICLD

Engaging Communities through Etuamptumk 'Two-Eyed Seeing':

- Learning to see from one eye the strengths of Indigenous knowledge and ways of knowing and from the other eye Western knowledge and ways of knowing .... And learning to use both these eyes for the benefit of all

ICLD

Key Take Aways

Early, inclusive, and consistency are essential for accountable partnerships.

Comprehensive Identification: Initiate the engagement process by conducting a comprehensive identification of First Nations communities that may share mutual interests. This involves considering Indigenous communities located on formal reserves as well as those with traditional territories in the vicinity.

Early and Inclusive Engagement: Initiate early, comprehensive, and inclusive engagement. Share detailed information about the proposed activity, engage in face-to-face meetings where possible, and allow for modifications. Maintain ongoing dialogue.

Building Relationships: Foster relationships based on trust and respect. Engage with First Nations before project planning is complete, emphasizing understanding through multiple meetings and follow-ups.

Documented Engagement: Maintain clear records of the engagement process, including a detailed report and supporting documents. This documentation is essential for transparency and accountability.

Nakurmiik

Huy ch q'u

Maarsii

Thank you

CSAP

SOCIETY OF CONTAMINATED SITES
APPROVED PROFESSIONALS
OF BRITISH COLUMBIA

CSAP Submissions 101

Topics: How to do a review, forms, document management

David Mitchell, P.Eng.

WWW.CSAPSOCIETY.BC.CA

SUBMISSIONS 101

Overview Today:

1.	Preliminary Report Review	5 min
2.	Confirm Protocol 6 Eligibility	5 min
3.	Detailed Report Review / Edits	5 min
4.	Forms / Document Management	5 min
5.	CSAP Screening	5 min
6.	ENV Screening	5 min
7.	Instrument Follow-up	5 min

Preliminary Report Review

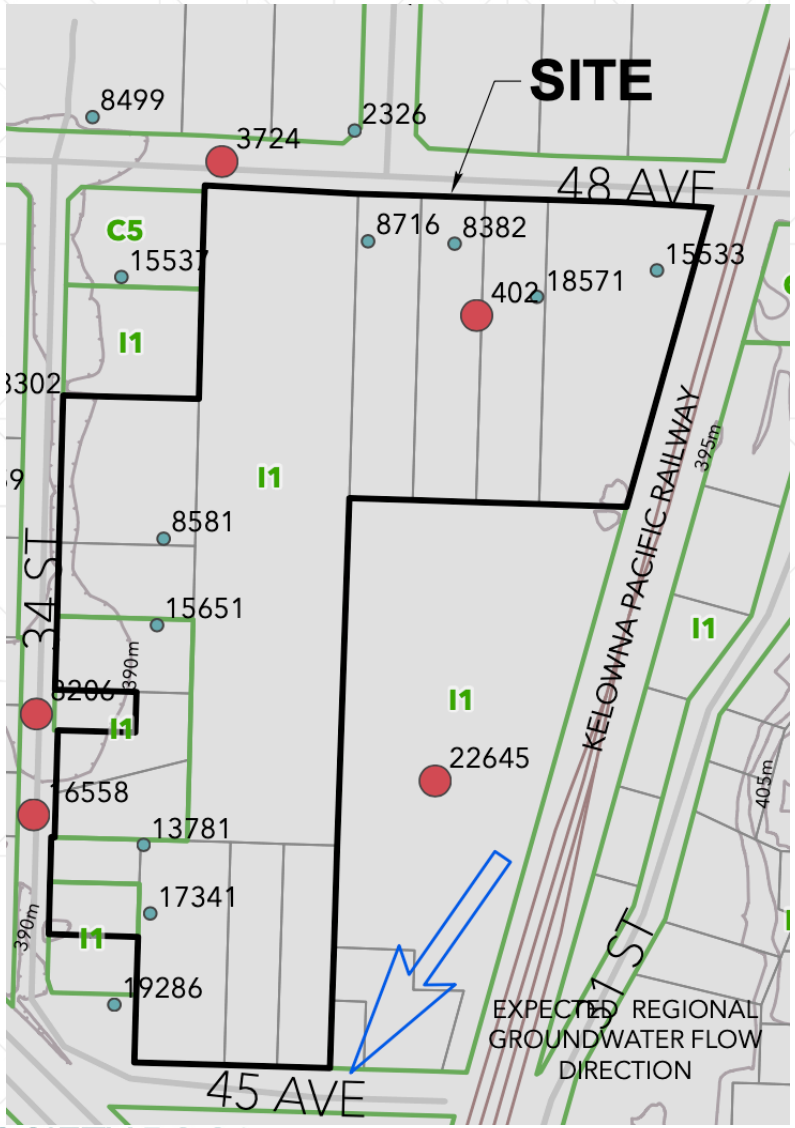
- Is everything there? Think 'CSR Boxes'
- Understand Site boundaries, impacted lands – Confirm!
- Impacted properties
- Up to date information – How old is Stage 1?
- Check Standards – Soil, GW, Vapour – Do they make sense?
- Reliance – Can information be used?
- Review all ENV correspondence

Complex Property Boundaries

LEGAL DESCRIPTIONS AND ZONING

Address	Parcel Identifier (PID)	Legal Description	Zoning
4703 34th Street	010-924-230	Parcel A (DD 112543F and Plan B5566) of Lot 1 District Lot 38 Osoyoos Division Yale District Plan 3340	I1 – Light Industrial
4707 34th Street	008-196-621	Lot 2 District Lot 38 Osoyoos Division Yale District Plan 3340	I1 – Light Industrial
4617 34th Street	010-990-607	Lot 20 Plan B4863 District Lot 38 Osoyoos Division Yale District	I1 – Light Industrial
4505 34th Street	010-923-161	Lot 1 District Lot 38 Osoyoos Division Yale District Plan 3355	I1 – Light Industrial
	010-923-845	The North 26 Feet of Lot 2 District Lot 38 Osoyoos Division Yale District Plan 3355	I1 – Light Industrial
4503 34th Street	010-923-608	Lot 3 District Lot 38 Osoyoos Division Yale District Plan 3355	I1 – Light Industrial
	010-923-641	Lot 1 District Lot 38 Osoyoos Division Yale District Plan 3355	I-1 District, allowing for light industrial uses.
	010-923-713	The North 24 Feet of Lot 4 District Lot 38 Osoyoos Division Yale District Plan 3355	I-1 District, allowing for light industrial uses.
3240 48th Avenue	010-990-496	Lot 19 District Lot 38 Osoyoos Division Yale District Plan 2630 Except Plan KAP55842	I1 – Light Industrial
3201 45th Avenue	010-991-255	Lot 26 District Lot 38 Osoyoos Division Yale District Plan 2630	I1 – Light Industrial
	010-991-280	That Part of Lot 27 Lying West of the Straight Line Joining the Mid-Point of the North Boundary with the Mid-Point of the South Boundary of Said Lot; District Lot 38 Osoyoos Division Yale District Plan 2630	I1 – Light Industrial
	010-991-263	Lot 27 District Lot 38 Osoyoos Division Yale District Plan 2630 Except That Part Lying West of a Straight Line Joining the Mid-Point of the North Boundary with the Point of the South Boundary of Said Lot	I1 – Light Industrial
3110 48th Avenue	010-954-252	Lot 1 District Lot 38 Osoyoos Division Yale District Plan 2752 Except (1) That Part Lying East of a Straight Line Bisecting the Said Lot and Running Parallel to the Easterly and Westerly Boundaries Thereof (2) Plan KAP55842	I1 – Light Industrial
3108 48th Avenue	010-954-350	That Part of Lot 1 Lying East of a Straight Line Bisecting the Northerly and Southerly Boundaries Thereof; District Lot 38 Osoyoos Division Yale District Plan 2752 Except Plan KAP55842	I1 – Light Industrial
3106 48th Avenue	010-954-392	Lot 2 District Lot 38 Osoyoos Division Yale District Plan 2752 Except Plan KAP55842	I1 – Light Industrial
3104 48th Avenue	010-954-449	Lot 3 District Lot 38 Osoyoos Division Yale District Plan 2752 Except Plans 42131 and KAP55842	I1 – Light Industrial
4607 34th Street	010-990-534	The South 3.3 Chains of Lot 20 District Lot 38 Osoyoos Division Yale District Plan 2630 Except Plans B5287 and 21799	I-1 District, allowing for light industrial uses.
4605 34th Street	005-261-228	Lot 1 District Lot 38 Osoyoos Division Yale District Plan 21799	I-1 District, allowing for light industrial uses.

Confirm Boundary



- KAP2630.pdf
- KAP2752.pdf
- KAP3340.pdf
- KAP3355.pdf
- TITLE- CA5464918-PID- 010-923-641.pdf
- TITLE- CA5464919-PID- 010-923-608.pdf
- TITLE- LB133266-PID- 010-990-607.pdf
- TITLE-CA5464920-PID-010-923-713.pdf
- TITLE-CA7578587-PID-010-990-496.pdf
- TITLE-CA7578606-PID-010-991-255.pdf
- TITLE-CA8234121-PID-010-923-161.pdf
- TITLE-CA8234122-PID-010-923-845.pdf
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- TITLE-CA8234126-PID-008-196-621.pdf
- TITLE-CA8234128-PID-010-954-350.pdf
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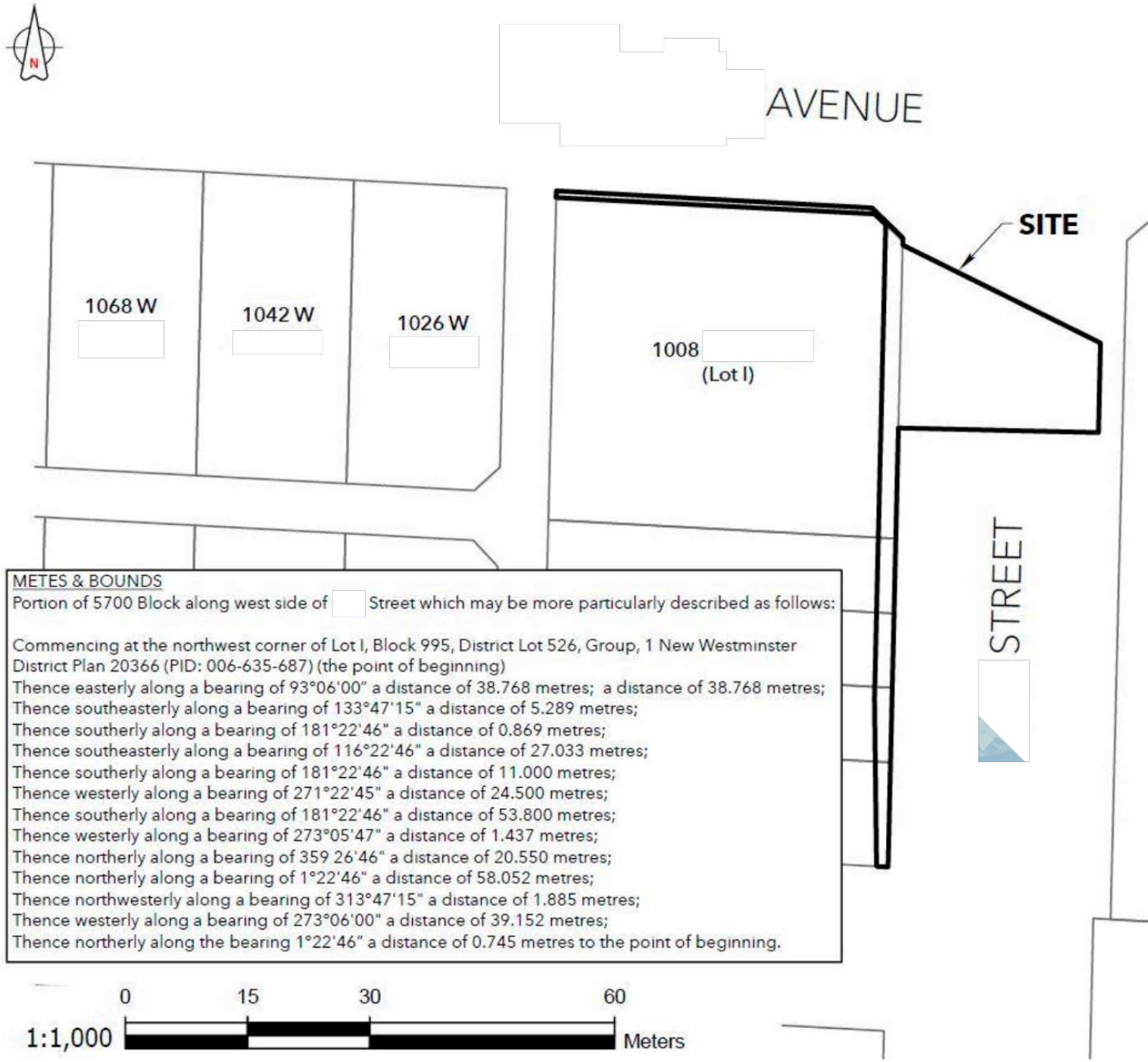
- TITLE-CA8234130-PID-010-991-263.pdf
- TITLE-CA8234131-PID-010-991-280.pdf

Metes and Bounds



Protocol 6 Eligibility

- Is Arm's Length required?
- Is application risk-based? Is Risk Assessor engaged?
- Impacted Site issues? Comingled plumes?
- High Risk Sites – Confirm and Confirm interim and future uses
- Pay attention to raw vapour results and ">" concentrations
- Has full delineation been achieved?
- Part site issues
- Plume stability – DNAPL, LNAPL migration

Detailed Report Review

- Confirm standards again – Soil, GW, Vapour
- Review against Protocols – assessment spacing
- Does delineation make sense – depths, areas
- Is the rationale for interpretation documented?
- Deficiencies / data-gaps listed in reports?
- Have all ENV notifications been prepared?

Detailed Report Review – No. 1 Issue

Reports not structured into CSR Boxes

- Stage 1 – APECs and PCOCs
- Stage 2 – Assessment of APECs and PCOCs
- DSI – Delineation of AECs and COCs
- Remediation – Resolution of AECs and COCs

Consider rejecting a report early before your review! Your job is reviewing the work, not doing it.

The SOSC lays it out very well. Use that.

SOSC – ‘CSR Boxes’

Stage 1 and Stage 2 - Section 4.5

Area of Potential Environmental Concern (APEC)			Check where analyses completed							
#	**Description** *(describe location in relation to process source, waste, fill, land use or activity, etc. giving rise to APEC, and if APEC is primarily due to soil or water contamination)*	**Potential Contaminant of Concern (PCOC)** *(indicate products, chemicals, waste type, etc. and / or analytical parameter)*	Soil	Sediment	Ground Water	Surface Water	Vapour	Other (explain)	**Add**	**Delete**

SOSC – 'CSR Boxes'

Detailed Site Investigation - Section 4.6

				Extent of Contamination			
AEC / APEC # (Use same #s as for APECs in Table above)	**Contaminant of Concern**	**Medium** (e.g., soil, groundwater, sediment, vapour, surface water, other)	**Maximum Measured Concentration** (indicate units)	**Area (m^2)**	**Depth Range (m)**	Add	Delete
						+	-
						+	-
						+	-

SOSC – 'CSR Boxes'

Remediation - Section 5.3

				Extent of Contamination			
AEC / APEC # (Use same #s as for APECs in Table above)	**Contaminant of Concern**	**Medium** (e.g., soil, groundwater, sediment, vapour, surface water, other)	**Maximum Measured Concentration** (indicate units)	**Area (m^2)**	**Depth Range (m)**	Add	Delete
						+	-
						+	-
						+	-

Detailed Report Review Edits

- It's common to make edits to reports or to require edits. Recommend tracking version history.

AE PROJECT NUMBER: 2633
February 2023
Version 3.0

- EGBC and internal policy questions. I don't have answers but beware of report dates, signatures, saving documents…
- Eyeball report dates to match submission dates?
- Version x.x. First x is changing substantial which means the date should change. A minor change (e.g., typo) is a decimal change
- Fine line between 'directing work' and 'reviewing work'.

Forms / Document Management

- These are living documents with many contributors.
- Organization and document management is critical.
- Separate draft documents from issued documents.
- Tip - Number your documents to keep better order.
- Tip - What will everything look like the day you make the submission? (e.g. subdivisions, ownership, regulations). Plan your documents for that time.

"Half done is well begun." Aristole

Version History

Once submitted, if you make edits, keep track of Versions.

- Version 1.0 – Version sent to CSAP
- Version 2.0 – Preliminary Screening
- Version 3.0 – Detailed Screening
- Version 4.0 – ENV Edits
- Decimals for multiple responses within each (e.g. V2.2).

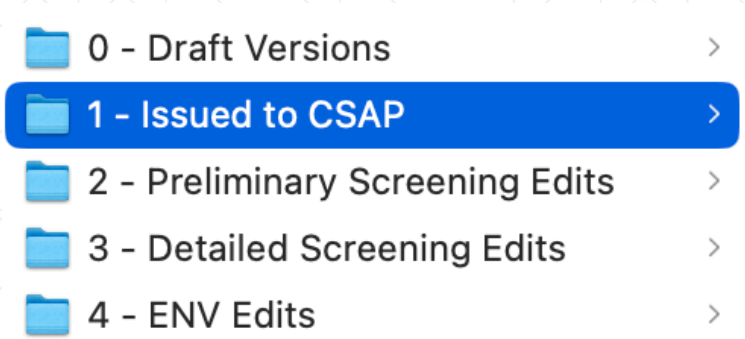
Time Killers to Watch for

- Need to copy interested parties on title. Finding their contact information is sometimes not easy.

Nature:	MORTGAGE
Registration Number:	CA5516050
Registration Date and Time:	2016-09-20 11:47
Registered Owner:	COMPUTERSHARE TRUST COMPANY OF CANADA INCORPORATION NO. A0052313
Remarks:	INTER ALIA

- Consultation with off-Site parties – Need to provide a copy of all documents. But your documents aren't done until you're ready to submit.
- Situations that require a pre-approval.

Forms / Document Management



Forms / Document Management

- 0 - Draft Versions
- 1 - Issued to CSAP
- 2 - Preliminary Screening Edits
- 3 - Detailed Screening Edits
- 4 - ENV Edits

- 0 - Transmittal - 1234 Green Street, Vancouver, BC - DRAFT.docx
- 1 - CSSA - 1234 Green Street, Vancouver, BC_V1.0_DRAFT.pdf
- 4 - SoSC - 1234 Green Street, Vancouver, BC - DRAFT.pdf
- 5 - SRC - 1234 Green Street, Vancouver, BC - DRAFT.pdf
- 6a - TGD 10 Checklist - 1234 Green Street, Vancouver, BC - DRAFT.xlsx
- 6b - TGD 11 Checklist - 1234 Green Street, Vancouver, BC - DRAFT.xlsx

Consistency, Consistency, Consistency

The submissions documents are repetitive.

- Lat / Long
- Site Owner
- Applicant
- Agent
- Approved Professionals
- Address / PID
- Site ID

Decide on the above before filling out forms.

Preliminary Screening

- 1 in 8 applications are randomly selected at this stage. If so, you are typically notified within a few working days of submission.
- CSAP (Anna) will check for big picture stuff, similar to the first slide above.
- She will send you a list of issues via an email. You should save that email to the file folder for a record of what drove document edits.
- The quicker you respond, the quicker things move forward.

Preliminary Screening

Submission CSAP # 22-154 Site 15171

AP

Anna Popova <apopova@csapsociety.bc.ca>

Friday, March 31, 2023 at 9:28 AM

To: David Mitchell

To protect your privacy, some external images in this message w... Download external images Go to Settings

Hi Dave,

There is one typo in legal description for PID 014-782-766: Should be DD2787A(1), not DD3787A(1). Please fix in CSSAF, SRCR and SoSC.

Kindest regards,

Anna Popova

CSAP Society
Administrative Screener
apopova@csapsociety.bc.ca
Cell 778-994-3300

Preliminary Screening

- 0 - Draft Versions
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- 4 - ENV Edits

- Draft Versions
- Issued to CSAP
- Preliminary Screening Email.eml

- Draft Versions
- Issued to CSAP
- Preliminary Screening Email.eml

- 1 - CSSA - 1234 Green Street, Vancouver, BC_V2.0_DRAFT.pdf
- 4 - SoSC - 1234 Green Street, Vancouver, BC_V2.0_DRAFT.pdf
- 5 - SRC - 1234 Green Street, Vancouver, BC_V2.0_DRAFT.pdf

Preliminary Screening

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- Draft Versions
- Issued to CSAP
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- 1 - CSSA - 1234 Green Street, Vancouver, BC_V2.0.pdf
- 4 - SoSC - 1234 Green Street, Vancouver, BC_V2.0.pdf
- 5 - SRC - 1234 Green Street, Vancouver, BC_V2.0.pdf

Preliminary Screening Common Errors

1) Owners of all properties, included in the instrument should be shown in CSSAF and SOSC. Common mistake for AIPs, because they often combine multiple sites.

2) ENV fees cheque for P6 submissions should be always sent to CSAP and never to ENV or MoF directly (unless specifically instructed).

3) Owner's name and legal description should exactly match Land Title.

4) List of reports should be consistent in Transmittal Letter, SOSC Part 3 and certification document Sch. D. Location of appended reports should be clearly shown in Transmittal Letter.

Detailed Screening

- Detailed Screeners use an excel sheet to check through the submission.
- Primary focus is SOSC and instruments.
- Use the checklist before you submit to double check internally before you submit.

Detailed Screening

DETAILED ADMINISTRATIVE SCREENING

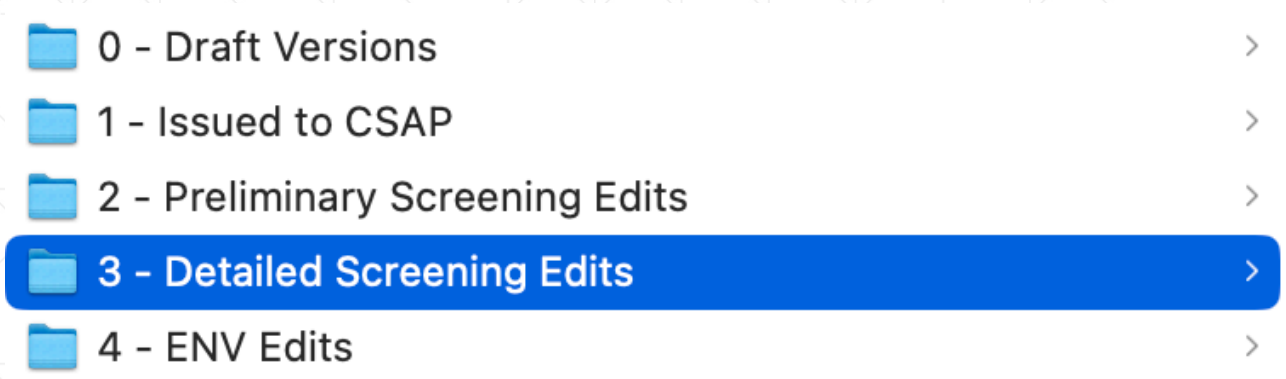
DRINKING WATER	Applies Y/N	Comment	Reference	Notes
DRINKING WATER	N		*P21, TG6*	
Does SoSC follow P21 and TG6 as applicable				
AP Response				

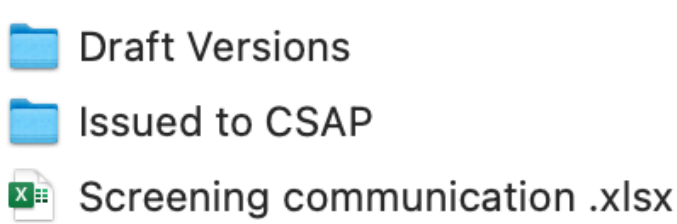
GENERAL TOPIC	Item	Point of Review	Yes	No	NA	Comments	Reference	Notes
SHEET - DETAILED SCREENING CHECKLIST								
AP Response								
Screener Response								
AP Response								
Screener Response								
AP Response								
Screener Response								
AP Response								
Screener Response								
SHEET - SUMMARY OF SITE CONDITION								
Applicable Numerical Concentration Standards and Criteria	4.4b	Vapour (CSR Schedule 3.3): - if other is specified above, include description of assumptions for both current and future development of the site that the selected vapour attenuation factors are based on. Has other been selected and sufficient information provided.		x		please clarify why AW f and no water use both apply or correct.	P22	
AP Response		No Water Use box unchecked. Only Awf applies						
Screener Response								
AP Response								
Screener Response								
AP Response								
Screener Response								
AP Response								
Screener Response								
SHEET - REGULATORY CONSIDERATIONS								
AP Response								
Screener Response								

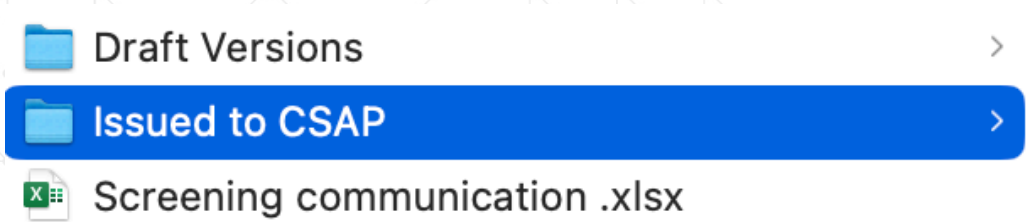
Detailed Screening

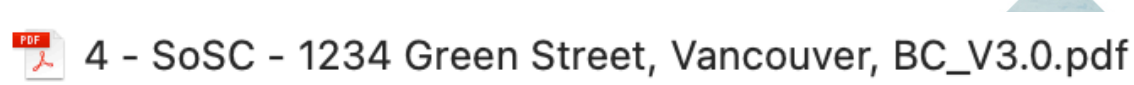
SHEET - SUMMARY OF SITE CONDITION				
Vapour (CSR Schedule 3.3): - if other is specified above, include description of assumptions for both current and future development of the site that the selected vapour attenuation factors are based on. Has other been selected and sufficient information provided.		x		please clarify why AW f and no water use both apply or correct.

Detailed Screening









Detailed Screening

SHEET - SUMMARY OF SITE CONDITION				
Vapour (CSR Schedule 3.3): - if other is specified above, include description of assumptions for both current and future development of the site that the selected vapour attenuation factors are based on. Has other been selected and sufficient information provided.		x		please clarify why AW f and no water use both apply or correct.
No Water Use box unchecked. Only Awf applies				

Detailed Screening

Dear Mr. Green,

Please be advised that the submission described below has been screened by CSAP and transferred to the Ministry of Environment on September 18, 2023 for final review.

A: Certificate of Compliance with an Approval in Principle Numerical Standards
Site id: 2385
Location: 1234 Green Street, Vancouver, BC

Kindest regards,

Anna Popova

CSAP Society
Administrative Screener
apopova@csapsociety.bc.ca
Cell 778-994-3300

ENV Screening

- Most common edits are to the instruments, cover letters and the SOSC.
- Questions of consultation are typically dealt with here.
- By this point, some of your documents could be out of date (e.g., titles).
  - Common that ownership changes occur on properties going through approvals.
  - Lot boundaries and road dedications can occur.

ENV Screening

- 0 - Draft Versions
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- 3 - Detailed Screening Edits
- 4 - ENV Edits

- Draft Versions
- ENV Screening Email.eml
- Issued for Use

- Draft Versions
- ENV Scre...g Email.eml
- Issued for Use

- 3a- AiP Cover Letter - 1234 Green Street, Vancouver, BC - V4.0.docx
- 3b- AIP - 1234 Green Street, Vancouver, BC - V4.0.docx

Final Step - Follow-up

Once an instrument has been received:

- Confirm it’s correct.
- Confirm it’s been provided to all parties
- Conditions – Inform necessary parties
- Annual Reports – Put it in your calendar now or email the Responsible Person to do so.