



AWMA 2022 RECAP



RECAP

Data Issues

Most Common Data Issue: #1 Elevated Reporting Limits

- ▶ For COC that are not detected, RECAP requires that the Sample Quantitation Limit (also referred to as the Reporting Limit) be less than the LSS or LRS prior to eliminating the COC from further assessment
 - ✓ Page 29: In the RECAP submittal, non-detected results shall be reported as less than the numerical value of the SQL (e.g., < 5 ug/l) and a comparison of the SQL to the limiting SS or RS shall be presented for all constituents reported as not detected to demonstrate that the SQL are less than or equal to the limiting SS or RS prior to eliminating a COC from further assessment.
- ▶ Data gaps due to elevated Reporting Limits should be resolved early in the RECAP process - if possible, determine why and correct
- ▶ Data Evaluation and Useability requirements: Section 2.5

The results of the data evaluation shall be presented in the RECAP submittal (RECAP Form 3) and shall address: (1) the appropriateness of the analytical method used and the sample quantitation limits; (2) the results of the blank analyses; (3) the TIC detected; (4) any calibration or matrix spike recoveries outside the acceptable range; (5) the results of the performance evaluation; and (6) the precision of the analyses. **Based on the evaluation of the QA/QC data and the reported results, the Submitter shall make recommendations in the RECAP submittal concerning the usability of the data for RECAP purposes.** Data determined not to be acceptable for RECAP shall be identified and justification for the determination shall be given.

Elevated Reporting Limits

- ▶ Always communicate Reporting Limit requirements with laboratory prior to sample collection
- ▶ If reporting limits are > LRS and results are ND, check with laboratory for reason
- ▶ Common reasons for elevated reporting limits:
 - ❖ matrix interference
 - ❖ presence of one or more COC at high concentrations requiring sample dilution prior to analysis
 - ❖ presence of non-target analytes
- ▶ Nontarget analytes:
 - ❖ request tentatively identified compounds
 - ❖ conduct fingerprint analysis of most heavily impacted area of AOI
 - ❖ resample with extended analyte list based on site history

Elevated Reporting Limits

- ▶ Do not include elevated reporting limits in the RECAP assessment
- ▶ ↑ Reporting Limit \neq AOIC
 - do not use elevated report limits as the AOICs
 - do not use 1/2 elevated report limit as the AOIC
- ▶ Determine the impact of data gaps created by elevated RL in data evaluation
 - ❖ Determine if additional sampling needed for delineation of AOI or evaluation of POE
 - ❖ Other significant data gap

#2 Laboratory Reporting

- ▶ Laboratory report should include results for the full method analyte list
- ▶ Selective reporting could result in only partial characterization
- ▶ Reporting of J values (detections between the Reporting Limit and Method Detection Limit) - **yes!**

#3 Resampling: When is it appropriate? When is it not?

- ▶ Re-sampling of locations with exceedances
 - ❖ What medium? Soil vs Groundwater
 - ❖ What type of COC(s) and time since last sampling?
 - ❖ “Remediation” via re-sampling - **No**
 - ❖ When a sample location is “re-sampled”, the data from the re-sampling supplements **NOT** replaces the existing data for that location

Resampling - When is it warranted?

- ▶ Resampling data replaces existing data when:
 - A RS for a TPH mixture is exceeded and TPH fractionation data are obtained for that location
 - Soil has been removed or moved and existing data are no longer representative
 - Existing data are not valid or are questionable based on QA/QC data or other technical factor (e.g. matrix interference, elevated SQL, etc)
 - Existing data is very old and likely not representative of current site conditions, i.e., benzene in surface soil or groundwater and available data is 15 years old
 - Other valid technical or analytical reason

#4 Geophysical parameters - MO-2 and MO-3

- ✓ Collect sample in an area of non-impacted soil that is representative of the soil conditions within the AOI

Fraction of organic carbon (f_{oc})

- ✓ Method of analysis - f_{oc} calculation**
 - Heat loss on ignition (ATSM D2974)
 - $f_{oc} = \text{organic matter (\%)} / 174$
 - Total Organic Carbon (SW846 Method 9060 modified)
 - $f_{oc} = \text{TOC (mg/kg)} / 10^6$
- ✓ **Submittal should clearly identify the site-specific f_{oc} and how it was derived**
- ✓ The f_{oc} must be site-specific; an f_{oc} from another site cannot be used; an f_{oc} from literature cannot be used
- ✓ If sample is obtained within AOI, f_{oc} may be biased high
- ✓ Chain of Custody lists the analysis test as “ f_{oc} ” instead of Method D2974
- ✓ f_{oc} memo on RECAP website

#5 Polychlorinated Biphenyls (PCBs)

- ▶ Congener data vs Aroclor data
 - An Aroclor is a mixture of PCB congeners
 - Aroclor 1260: 12 = 12 carbons and 60 = 60% chlorination
 - Due to weathering, the composition of the mixture changes over time
 - Analytical method for Aroclors is based on pattern recognition, therefore, Aroclor data is nonspecific and may underestimate amount of PCB present due to weathering
 - Congener data is very specific, better assessment of presence and toxicity
 - Congener data more expensive than Aroclor data
 - Compromise: analyze for WHO 12 PCB DLC (risk drivers)
 - Media - soil, sediment, fish, GW₁, etc.
 - Pathway - especially important for bioaccumulation pathway
 - Reporting limits:
 - ❖ Aroclors 50 ppb
 - ❖ PCB congeners <10 ppt

Polychlorinated Biphenyls

- ▶ PCB congener approach requires a two-fold assessment
 1. Total PCB congener concentration is compared to PCB RS
 2. A Total TEQ is calculated for the WHO 12 PCB congeners compared to 2,3,7,8-TCDD RS
- ▶ Aroclor data is compared to PCB RS

Identification of Soil AOI

- ▶ Assume the property as a whole is the AOI - NO!
- ▶ Divide the property into AOIs based on historical/former uses of the property - NO!
- ▶ Identify the AOI using a LSS or LRS? YES!
- ▶ If land use changes and the original AOI is being subdivided, re-evaluate the AOI/AOIC(s) based on new exposure areas
- ▶ If land use changes and redevelopment will result in soil removal, movement, etc consider these changes in relation to the known COC distribution, AOI, and AOIC

Identification of the Soil AOIC

- ❑ AOIC = Max or 95%UCL-AM Concentration
- ❑ When to use the Max
 - ✓ Screening option
 - ✓ Too few data points to calculate a 95%UCL-AM
 - ✓ Too many ND results to calculate 95%UCL-AM (usually post-remediation)
 - ✓ 95%UCL-AM > Max
- ❑ When not to use the Max
 - ✓ Max > LRS
 - ✓ There are sufficient data points to calculate 95%UCL-AM
- ❑ 95%UCL-AM dataset should only include the data points on or within the boundaries of the AOI
- ❑ Need more info? Refer to Sx 2.8

Calculating the AOIC - 95%UCL-AM

- ▶ EPA's ProUCL 5.2 <https://www.epa.gov/land-research/proucl-software>
- ▶ Include all data points on or within boundaries of AOI
- ▶ Minimum of 10 -15 observations needed (incremental composite sampling)
- ▶ Excel - import/export

Soil AOIC 95%UCL-AM: ProUCL common mistakes

- ▶ Censored vs non-censored data sets
- ▶ Nondetects: Enter the full (not ½) reporting limit
- ▶ Not enough data points
- ▶ Too many ND in dataset
- ▶ Using a 95%UCL-AM value other than the recommended UCL
- ▶ **Not including the worksheet with input values and/or output summary with recommended UCL in the submittal**
- ▶ Not using the 95%UCL-AM - using the max concentration as the AOIC
- ▶ Ignoring warnings provided in output summary

Land Use - Soil Exposure

Why is land use important?

- ▶ Land use determines exposure potential
 - The greater the exposure potential, the lower the risk-based standard
- ▶ **Non-industrial Land Use**
 - Residential exposure
 - ↑ exposure frequency/duration; child receptor
 - Recreational, trespasser, etc
- ▶ **Industrial/Commercial Land Use**
 - Worker exposure
 - Conveyance Notice
- ▶ Land use
 - North American Industry Classification System (NAICS)
 - RECAP Section 2.9 and Appendix E

Land Use

- ✓ Current and future land use should be considered
- ✓ If land is undeveloped/future use is not known:
 - Zoning/development plans
 - Surrounding land use
 - Assume non-industrial
- ✓ **Change in land use**
 - May change exposure potential: EF/ED, exposure pathways, receptors
 - May warrant additional site evaluation, investigation, and remediation
 - Almost always changes AOI and AOIC
- ✓ Meeting non-industrial RS within the AOI ≠ unrestricted property use

RECAP

Standards

SS and MO-1 RS for COC not listed in RECAP Tables 1-3

- ▶ All COC are regulated under RECAP
- ▶ Most current toxicity data shall be used
 - ✓ IRIS <https://www.epa.gov/iris>
 - ✓ PPRTV <https://www.epa.gov/pprtv>
 - ✓ Others sources: ATSDR MRLs, California EPA, HEAST
- ▶ Toxicity Value Unit conversions for use in spreadsheet:
 - Reference Concentration (RfC) $\text{mg}/\text{m}^3 \rightarrow$ Inhalation Reference Dose (RfD_i) $\text{mg}/\text{kg}/\text{day}$
 - multiply RfC by 20 m^3/day then divide by 70 kg
 - Inhalation Unit Risk (IUR) $\text{risk}/\text{ug}/\text{m}^3 \rightarrow$ Inhalation Slope Factor (SF_i) $\text{risk}/\text{mg}/\text{kg}/\text{day}$
 - multiply IUR by 70 kg then divide by 20 $\text{mg}/\text{m}^3 \times 1000 \text{ ug}/\text{mg}$
- ▶ If the COC is a mutagen, soil RS must be calculated under MO-3 for non-industrial land use and for GW1/2 (if no MCL) (~~RECAP Spreadsheet~~)

RS for COC not listed in RECAP Tables 1-3

1. SF&RfD Tab - enter toxicity values

ADDITIONAL COMPOUNDS										
ORGANIC COUMPOUNDS	CAS #	SF _o		SF _i		RfD _o		RfD _i		ABS
Bis(2-chloroisopropyl)ether	108-60-1	7.00E-02	H	3.50E-02	H	4.00E-02	I	4.00E-02	*	0
Benzene	71-43-2	2.90E-02	I	2.90E-02	I	4.00E-03	I	8.60E-03	I	0
Benzene	71-43-2	2.90E-02	I	2.90E-02	I	4.00E-03	I	8.60E-03	I	0
Benzene	71-43-2	2.90E-02	I	2.90E-02	I	4.00E-03	I	8.60E-03	I	0
Benzene	71-43-2	2.90E-02	I	2.90E-02	I	4.00E-03	I	8.60E-03	I	0
Benzene	71-43-2	2.90E-02	I	2.90E-02	I	4.00E-03	I	8.60E-03	I	0
Formaldehyde	50-00-0	4.60E-02	*	4.60E-02	I	2.00E-01	I	2.00E-01	*	0.1
INORGANIC COMPOUNDS										
Antimony	7440-36-0	*****		*****		4.00E-04	I	4.00E-04	*	0.01
Antimony	7440-36-0	*****		*****		4.00E-04	I	4.00E-04	*	0.01
Antimony	7440-36-0	*****		*****		4.00E-04	I	4.00E-04	*	0.01

2. Chem&Phy data Tab - enter physical/chemical properties

ADDITIONAL COMPOUNDS													
ORGANIC COUMPOUNDS	CAS #	MOL. WT	Koc		H		Da		Dw		S		
Bis(2-chloroisopropyl)ether	108-60-1	171.04	6.17E+01	4	1.13E-04	4	5.95E-02	E	6.62E-06	E	1.70E+03	4	
Benzene	71-43-2	78.11	6.17E+01	1	5.55E-03	1	8.80E-02	1	9.80E-06	1	1.75E+03	1	
Benzene	71-43-2	78.11	6.17E+01	1	5.55E-03	1	8.80E-02	1	9.80E-06	1	1.75E+03	1	
Benzene	71-43-2	78.11	6.17E+01	1	5.55E-03	1	8.80E-02	1	9.80E-06	1	1.75E+03	1	
Benzene	71-43-2	78.11	6.17E+01	1	5.55E-03	1	8.80E-02	1	9.80E-06	1	1.75E+03	1	
Benzene	71-43-2	78.11	6.17E+01	1	5.55E-03	1	8.80E-02	1	9.80E-06	1	1.75E+03	1	
Formaldehyde	50-00-0	30.03	3.63E+00	5	3.40E-07	2	1.80E-01	3	2.00E-05	3	5.50E+05	2	
INORGANIC COMPOUNDS													
Antimony	7440-36-0	121.75	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Antimony	7440-36-0	121.75	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Antimony	7440-36-0	121.75	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****

Calculation of MO-2 RECAP Standards

MO-2: Use of site-specific soil properties

- ▶ Geotechnical lab
- ▶ Values in blue shaded cells can be changed
 - dry soil bulk density
 - total soil porosity
 - water-filled soil porosity
 - air-filled soil porosity,
 - soil particle density
 - fractional organic carbon
 - source length and width

Soil properties		Management Option 2				
Revision Date: 08/04/2003						
Run date:	9/15/2022					
*****calculation inputs*****						
1.7	g/cm3			pb = dry soil bulk density		
0.358491	Lpore/Lsoil			n = total soil porosity		
0.21	Lwater/Lsoil			nw = water-filled soil porosity		
0.148491	Lair/Lsoil			na = air-filled soil porosity		
2.65	g/cm3			ps = soil particle density		
0.006	g/g			foc = fractional organic carbon in soil		
148	(ft) = L = length of the source at the water table					
148	(ft) = W = width of impacted area perpendicular to flow direction of aquifer					
0.5	Acres			AOI site area - input into Q/C equation below		
76.30616	g/m2-s per kg/m3			Q/C = inverse of mean concentration at center of square source		
Q/C Table						
site size	148*148	209*209	295*295	467*467	660*660	1143*1143
site size	0.5 acre	1 acre	2 acre	5 acre	10 acre	30 acre
Q/C value	76.3062	67.4304	59.872	51.4648	46.1707	39.2329

Calculation of MO-2 RECAP Standards

MO-2 Example: Use of site-specific foc

Benzene, site-specific $f_{oc} = 0.02$

→ Spreadsheet, soil properties and Q/C tab, replace default f_{oc} of 0.006 with 0.02

→ Open the tabs of each RS to get new values based on site-specific foc

mg/kg	Soil _{ni}	Soil _i	Soil _{GW1} Soil _{GW2}	Soil _{GW3DW}	Soil _{GW3NDW}	Soil _{sat}	Soil _{esni}	Soil _{esi}
Default	0.79	1.6	0.011	0.0023	0.027	900	1.0	2.5
Site-specific	1.3	2.6	0.029	0.0063	0.071	2400	2.7	6.7

MO-2: AOI Source Size: Why is it important?

❖ Criteria for the Management of Soil and Groundwater Under SO and/or MO-1

- The area of impacted soil is approximately 0.5 acre or less. [The Q/C parameter for the calculation of the volatilization factor for $Soil_i$ and $Soil_{ni}$ and the S_w parameter for the calculation of the dilution factors (DF) for $Soil_{GW2}$ and $Soil_{GW3}$ are based on an area of impacted soil that is 0.5 acre in size.]

Example: Benzene $Soil_i$ (SO or MO-2)

Site size	148*148	209*209	295*295	467*467	660*660	1143*1143
Site size ft ²	21,904	43,681	87,025	218,089	435,600	1,306,449
Site size	0.5 acre	1 acre	2 acre	5 acre	10 acre	30 acre
$Soil_i$ mg/kg	3.1	2.7	2.4	2.1	1.9	1.6

❖ AOI > 0.5 acre

- Calculate SO SS using site-specific source area
- Calculate MO-2 RS using site-specific source area
- Calculate site-specific dilution factor - Do not use MO-1 default DFs!

Calculation of MO-3 RECAP Standards

MO-3 Site-specific RS

- ▶ Most current toxicity data shall be used
- ▶ Site-specific exposure parameters or the most current default exposure parameters shall be used
- ▶ Site-specific or LDEQ state soil properties shall be used
- ▶ Appendix H spreadsheet may be used; most current risk assessment methods preferable
- ▶ EPA Calculator recommended for $Soil_{ni}$, $Soil_i$, GW_1 , GW_2 , C_a
 - ❖ Exceptions - TPH
- ▶ Mutagens for nonindustrial land use - EPA calculator must be used (all management options)
- ▶ EPA calculator https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

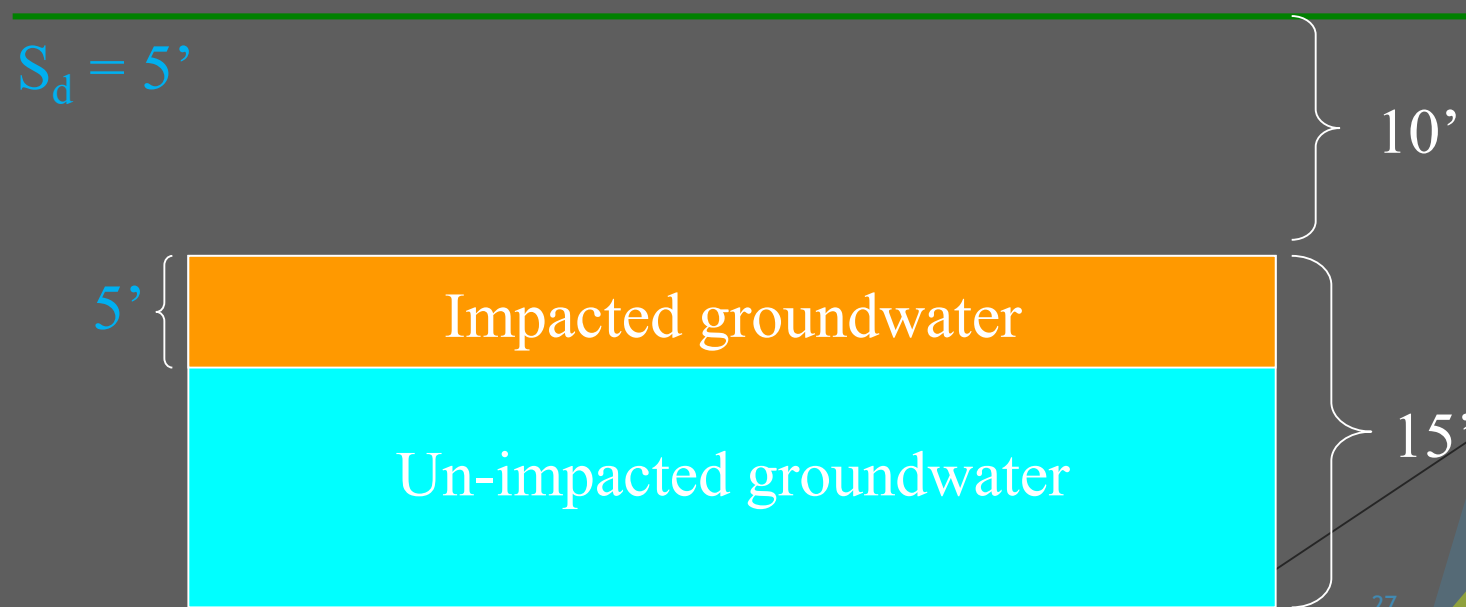
SPLP Data

- ❖ Soil samples for SPLP analysis should be taken in the most heavily impacted area(s)
- ❖ Evaluation of SPLP results:
 - ✓ GW1 zone: SPLP results \leq GW₁ RS x 20
 - ✓ GW2 zone: SPLP results \leq GW₂ RS x 20 x DF2
 - ✓ GW3 zone: SPLP results \leq GW₃ RS x 20 x DF3
- ❖ SPLP analysis replaces the use of Soil_{GW}, therefore, if the Soil_{GW} was the LRS, the LRS will become the lower of the remaining applicable standards

Dilution Factors: Definition of S_d

S_d = Thickness of impacted groundwater within permeable zone

$S_d \neq$ Depth of groundwater below ground surface



Mutagens

Acrylamide, benzidine, Cr⁺⁶, chloroprene, 1,2-dibromo-3-chloropropane, ethylene oxide, 3-methylcholanthrene, **methylene chloride**, 4,4'-methylene-bis(2-chloroaniline), N-nitroso-N-ethylurea, N-nitroso-N-methylurea, N-nitrosodiethylamine, N-nitrosodimethylamine, **cPAH**, **TCE**, 1,2,3-trichloropropane, urethane, **vinyl chloride**

- ▶ Carcinogens that cause a change in the DNA of a cell are referred to as mutagens
 - ▶ DNA changes may cause certain diseases, such as cancer
 - ▶ Increased susceptibility to mutagens during early-life
 - ▶ In the absence of chemical-specific data to evaluate differences in susceptibility, **age-dependent adjustment factors (ADAFs) should be applied**
 - ▶ The *Supplemental Guidance* establishes ADAFs for three specific age groups
 - ❖ 10X risk for birth to <2 yr
 - ❖ 3X risk for 2 yr to <16 yr
 - ❖ 1X risk for 16-70 yr
- Nonindustrial RS for mutagens cannot be calculated using: DEQ spreadsheet; calculate under MO-3 using current EPA protocols - ask for tox assistance - **exception is vinyl chloride**

If the SO or MO-1 RECAP Standards utilized in a RECAP assessment are not obtained from the RECAP tables

- ▶ Ensure numerical values match those in Tables 1-3; verification of the SS or RS is part of the submittal review
- ▶ Present SS or RS with 2 significant digits
- ▶ If the values submitted \neq values in Tables 1-3 \rightarrow NODs

Site-Specific Background

- ▶ Used for COC(s) detected that are likely to be attributable to background conditions rather than site activities
 - ✓ e.g., metals, PAHs, dioxins
 - ✓ urban vs non-urban
 - ✓ “urban fill” No
 - ✓ past land use(s)
- ▶ Background data should be collected in an area where the medium of interest shares the same characteristics as the AOI

Site-Specific Background

- ▶ Can be established for any environmental medium and biota
- ▶ Data collection must be outside of the area of concern and share similar characteristics as the AOI
- ▶ Minimum 4 discrete samples
- ▶ ≤ 7 discrete samples → use arithmetic mean as background
- ▶ ≥ 8 discrete samples → use the arithmetic mean + 1SD as background
- ▶ AOI arithmetic mean not 95%UCL-AM is compared to background
- ▶ State soil background for arsenic (Soil_{ni} and Soil_i) should be compared to arithmetic mean not 95%UCL-AM concentration
- ▶ Site-specific background levels are subject to Dept approval

Site-Specific Background

- ▶ If the LRS < background, then BG is used as LRS
- ▶ Use of Literature values - **maybe**
 - ✓ USGS
 - ✓ New Orleans studies PAHS, some metals (not Pb)
- ▶ Background vs Intended Use - Is a chemical present due to an intended use?
 - ✓ Was sample collected adjacent to a creosote piling? asphalt paving?
 - ✓ Be mindful of potentially confounding findings when selecting sampling locations

Submittal Forms

- ▶ **Use them!**
- ▶ Appendix C
- ▶ Forms serve to standardize submittals and assist the team leader's review
- ▶ Please don't create forms with different formats
- ▶ Submittal Requirements: Sections 3.4, 4.3, 5.4 and 6.9

Conveyance Notice

A conveyance notification shall be required under the following site conditions:

- ✓ COC in surface soil > Soil_{ni} (or Soil_{esni} if applicable)
- ✓ COC in groundwater 2 zone > GW_1 within property boundaries

Do not include in conveyance notice:

- × Exceedances of Soil_{GW} or Soil_{sat}
- × Exceedances of GW_3 RS
- × Not detected COC with elevated RLs

Obtain LDEQ approval prior to filing conveyance notice

Unique site conditions and unique management decisions

Occasionally, unique site conditions warrant non-traditional site management approaches/decisions

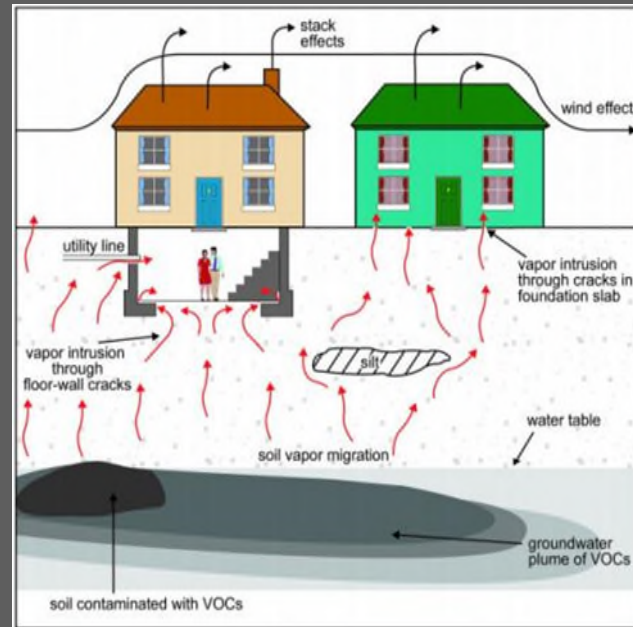
These approved site-specific decisions are likely not appropriate for use at other sites

Don't assume because a particular approach was approved for one site that it is okay to use the same approach at another site

Soil and Groundwater SS and RS should not be applied to media or material other than soil or groundwater

- ✓ Should only be applied to soil and groundwater under SS or MO-1 or MO-2
- ✓ SS and RS are NOT applicable to waste! (e.g., sludges, ash, etc)
- ✓ Soil standards should not be applied to other media such as sediments, plants, debris, etc.
- ✓ Groundwater standards should not be applied to other media such as surface water or rinsate

Vapor Intrusion



Source: EPA

Vapor Intrusion Pathway

RECAP states:

- ▶ **In general**, the $Soil_{es}$ and GW_{es} are applicable to soil and groundwater present at a depth **less than or equal to 15 ft bgs** that are impacted with volatile constituents and located beneath an enclosed structure. The need to evaluate the vapor intrusion pathway for soil and/or groundwater present at a depth **greater than 15 ft bgs** shall be determined by the Department **based on site-specific conditions** (COC present, nature of the release, subsurface characteristics, etc.) and the level of concern associated with the potential migration of volatile emissions from soil and/or groundwater to an enclosed structure.
- ▶ **Chlorinated Solvents**: The VI pathway can be complete for chlorinated solvents (TCE, PCE, DCE, VC) with source depths greater than 15 ft bgs

Vapor Intrusion Pathway - Chlorinated Solvent Releases

- ▶ Parent COCs + **Decomposition COCs** → NFA
- ▶ New toxicity values for PCE, TCE, carbon tetrachloride, 1,1,1-TCA, cis-1,2-DCE, and dichloromethane -recommend use of **MO-2** or **MO-3** (TCE)
- ▶ **TCE is a mutagen**, therefore MO-2 and MO-3 residential standards cannot be calculated using RECAP spreadsheet; use EPA SL calculator or VISL under MO-3
- ▶ **MO-3**: RECAP states the C_a shall be based on:
 - ❖ Louisiana Toxic Air Pollutant Ambient Air Standards
 - ❖ risk-based value based on default exposure assumptions
 - ❖ risk-based value based on site-specific exposure data
 - ❖ **risk-based value determined to be acceptable for site-specific conditions and approved by the Department**

Vapor Intrusion Pathway

- ▶ **LDEQ does not regulate indoor;** indoor air quality can be a key factor in the evaluation of the vapor intrusion pathway soil and/or groundwater contamination and remediation
- ▶ Soil_{es} and GW_{es} - based on older version of J&E Model
- ▶ EPA Vapor Intrusion Screening Level (VISL) Calculator
<https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator>
- ▶ Provides target risk-based screening-level concentrations for groundwater, near-source soil gas, sub-slab soil gas, and indoor air
- ▶ Can estimate target indoor air concentrations using soil vapor or groundwater data
- ▶ For planning purposes; may be an acceptable tool under MO-3 for development of RS

Vapor Intrusion - Petroleum

- ▶ METHOD FOR THE DETERMINATION OF AIR-PHASE PETROLEUM HYDROCARBONS (APH)
Massachusetts Department of Environmental Protection
- ▶ Fractions reported \neq RECAP fractions
 - ❖ C_5 - C_8 aliphatics \rightarrow use RfC and C_a for RECAP aliphatics $C_{>6}$ - C_8
 - ❖ C_9 - C_{12} aliphatics \rightarrow use RfC and C_a for RECAP aliphatics $C_{>8}$ - C_{16}
 - ❖ C_5 - C_8 aromatics \rightarrow use RfC and C_a for RECAP aromatics $C_{>8}$ - C_{16}
- ▶ Laboratories with LELAP Accreditation for MDEP APH
 - ❖ Eurofins in Folsom, California
 - ❖ SGS in Dayton, New Jersey
- ▶ MaDEP APH GC/MS method

NFI vs LSIR vs NFA

LSI Response vs No Further Action

~~NFI~~ → LSI Response

- ▶ NFI → Limited Site Investigation Response
- ▶ New name, same endpoint
- ▶ Limited dataset (e.g., Phase II)
- ▶ Applicable only to specific locations where the data was collected - **not the entire property**
- ▶ In most cases, LSS or LRS applied to individual data points (not 95%UCL-AM)
- ▶ All detected concentrations must be \leq LSS
- ▶ Compliance with industrial RS requires conveyance notice on sample locations not the entire property
- ▶ Compliance with nonindustrial RS does **NOT** imply unrestricted use of the property

NFA-ATT

- ▶ Assessment (and if warranted remediation) complies with RECAP (in general, NFA applies to known release)
- ▶ Applicable to an AOI - **not the entire property**
- ▶ AOIC/CC \leq Limiting SS, MO-1, MO-2 or MO-3 RS
- ▶ Compliance with industrial RS requires conveyance notice for AOI not the entire property

Limited Site Investigations

- ▶ Where applicable, data collection and evaluation shall meet RECAP requirements
- ▶ Submittal requirements should be met where appropriate or information is available
- ▶ SO: typically used for LSI
 - ▶ If a COC is not listed in Table 1, SS must be calculated for the COC using the spreadsheet; EPA Screening Levels may not be used
- ▶ MO-1: Generally, site investigation/available data are inadequate to conduct a MO-1 RECAP assessment
 - ❖ Available site information does not meet requirements for higher tiers of assessment (e.g., MO-1 requires groundwater classification, groundwater flow direction, delineation of AOI, etc)
 - ❖ There can be exceptions (sufficient site info is available, etc)
- ▶ If none of the COC exceed the Limiting Standard → Limited Site Investigation Response
- ▶ LSI Response only addresses the SAMPLING LOCATIONS not the property

NFA-ATT Clarifications

- ▶ Compliance of soil AOIC with non-industrial standards does not imply unrestricted/unlimited land/property use
- ▶ If land use changes from industrial to nonindustrial the Department shall be notified within 30 days and the AOI shall be re-evaluated
- ▶ Property re-development
 - √ AOI = Exposure Area and AOIC = exposure concentration
 - √ If future land use involves the division of a closed AOI into smaller parcels, then re-evaluation of COC distribution and exposure concentrations for newly defined areas is required

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