

Dear Working Group members,

In advance of Tuesday's meeting, DEEP is sharing three items. We've attached the two presentations we will give on Tuesday. One is on **Immediate Actions for SERs** and one is on **determining if a release of metals to soil is background**. For some context, below is the contours of the presentations.

Immediate Actions for SERs:

- SER triggers are very similar to current SEH triggers.
- SER Immediate Actions provide more structure and timelines to actions commonly utilized to mitigate and abate SEHs, and unlike the SEH program, the structure of the new SERs will provide defined closure endpoints.
- A key goal of these Immediate Actions is to prevent human exposure to SERs.
- Response actions focus on removing the release from the land and waters of the state, preventing migration of the release, and identifying and eliminating the source of the release.
- SER Immediate Actions will require submittal of an Immediate Action Plan.

The presentation on determining if a release of metals to soil is background will present the following options and how they relate to whether or not such detections will constitute a release.

- **Option 1 - Requires no background sampling and relies on baseline state-wide values for naturally occurring metals based on the 2014 Brown & Thomas study.**
- **Option 2** - Requires at least 3 background samples and has an upper limit that is also based on the 2014 Brown & Thomas study.
- **Option 3** - Requires at least 10 background samples and calculation of a 95% upper confidence limit (UCL) with an option for DEEP approval if the analysis results in a background value greater than the residential direct exposure criteria or an alternative approach is used.

We've also attached an **annotated program roadmap** that has links to past presentations and will help keep us all on the same page.

Finally, please keep in mind that DEEP is committed to this working group process and the opinion of all of you, its members. **This Working Group will continue to meet monthly until the regulations are adopted.** Even after we share a draft regulation package with you and the Working Group comments and DEEP responds (all before public notice is initiated and per statute), we will meet monthly. Throughout the public notice and engagement process, the Working Group will continue to have a strong voice on these regulations. We have invested in this process to this point, and we will continue that investment, as your input is incredibly valuable. We welcome your thoughts as we make progress toward our goal of launching the best cleanup program for Connecticut, together.

See everyone on Tuesday!

Best,
Graham

Graham J. Stevens
Chief

Bureau of Water Protection & Land Reuse



IMMEDIATE ACTIONS PART 2

By: John Gallalee, Monica Meschiatti, Lynn Olson-Teodoro, Amber Trahan, Gary Trombly, and Peter Zaidel

THE WORLD OF RELEASES

Current Universe requiring LEP involvement

Total cumulative values:

- **PTP – 6,213**
- **Voluntary Program – 570**
- (Verifications Not Submitted or Verifications Rejected)

- **Current Universe of Spills Reported under 22a-450**
- **Annually = 5,820**
- **10-year cumulative = 63,002**
- **Historical contamination at reported sites not in PTP or Voluntary program**
- **Annually = 1,236**
- **Current Universe of SEHs**
 - **10 year average = 37**



Emergent Reportable Release



Significant Existing Release

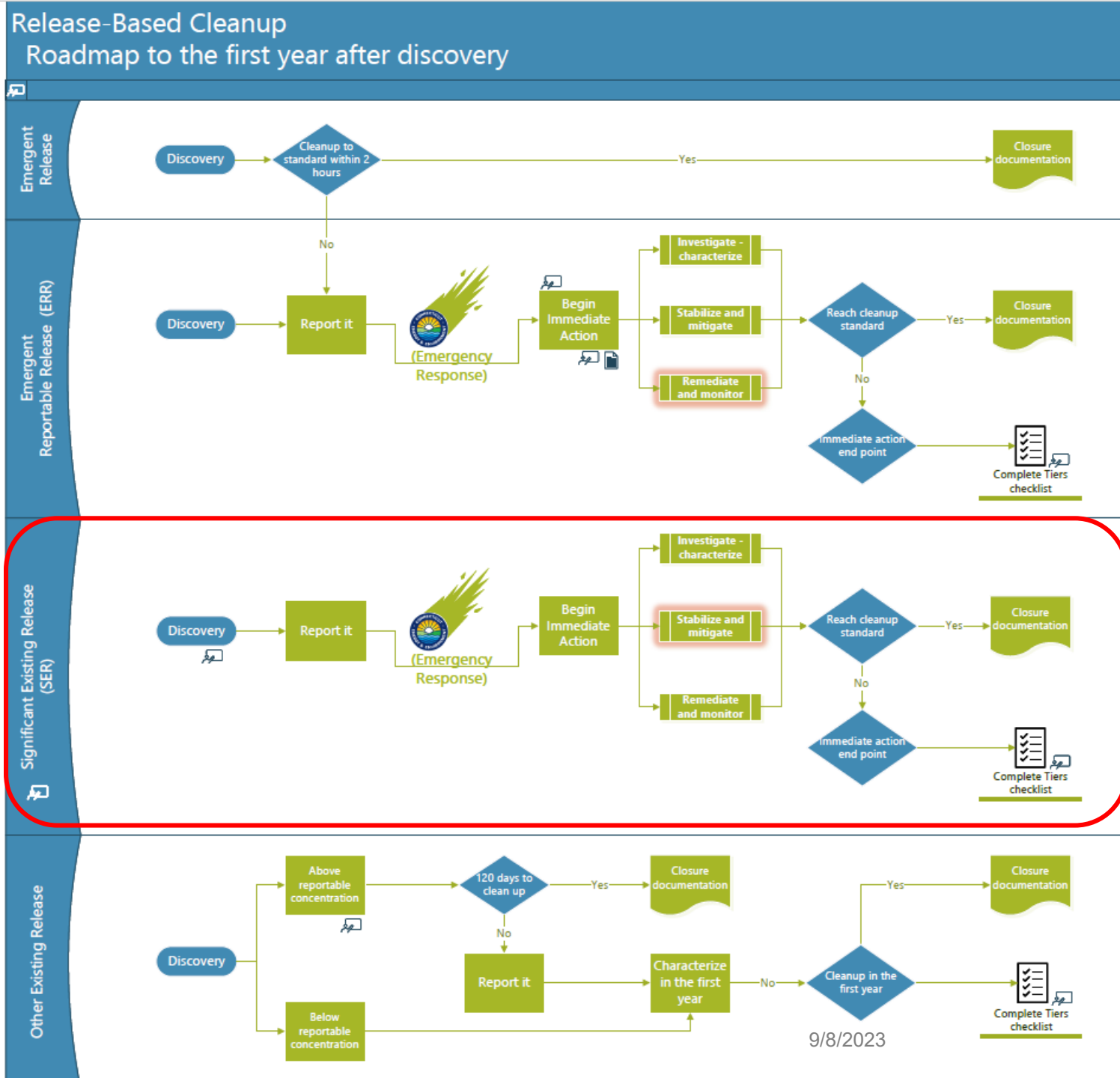
WHAT IS AN IMMEDIATE ACTION (“IA”)?

An IA is the immediate response upon discovery of a release by:

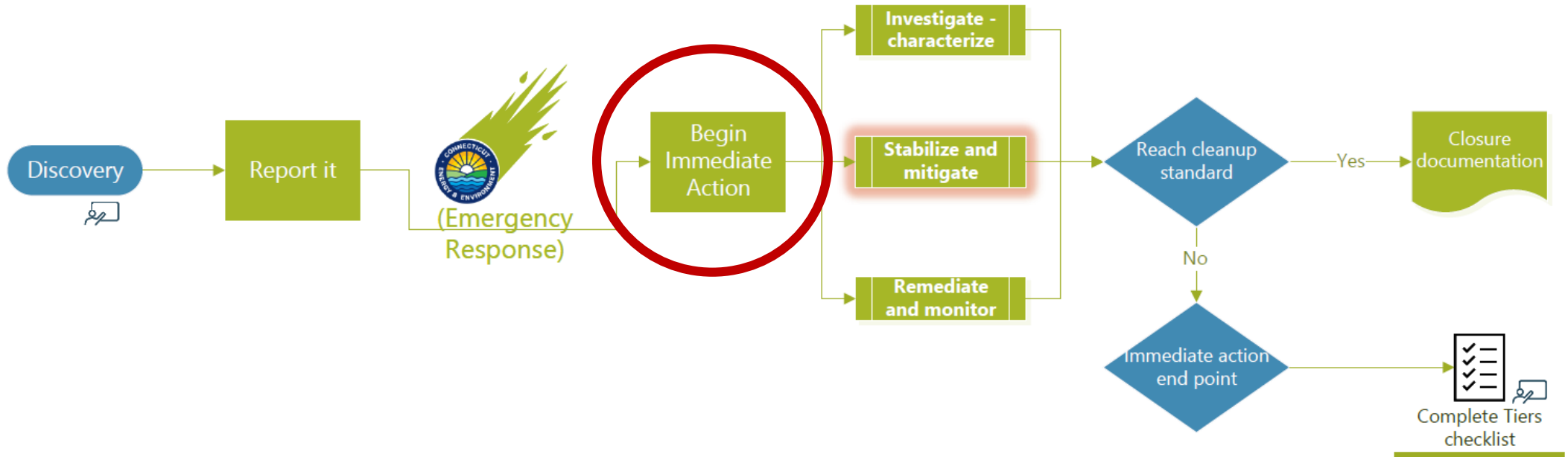
1. Removing the release from the land and waters of the state
2. Implementing measures to prevent migration of the release, such as active remediation techniques, the use of physical barriers, or appropriate treatment systems
3. Identifying the source of the release and eliminating it (with some exceptions)

Immediate means starting removal no later than 2 hours after such release is reported.

PLACE IN PROPOSED RELEASE-BASED FRAMEWORK



SIGNIFICANT EXISTING RELEASES



Significant Existing Release (SER)

TYPES OF RELEASES FOR WHICH IA IS REQUIRED

Emergent Reportable Release (“ERR”) –

“Emergent reportable release” means a release to the land and waters of the state discovered by an observed change in conditions that is required to be reported by regulations adopted pursuant to section 22a-450 of the Connecticut General Statutes.

Significant Existing Release (“SER”) –

“Significant existing release” means a release to the land and waters of the state discovered pursuant to section 22a-134tt-2 of the Regulations of Connecticut State Agencies that is present in the location identified by, or creating one or more of the impacts to public health or the environment identified in, subsection [placeholder] of this section.



SIGNIFICANT EXISTING RELEASE (SER) – TRIGGERS

SER Trigger	Criteria	Current SEH Law
Water supply well (from a release)	≥ Detection limit	22a-6u(b) and 22a-6u(c)
Polluted GW within 500 feet of water supply well	≥ GWPC	22a-6u(g)
Top 2 feet of soil	≥ 15 x applicable DEC	22a-6u(d)
Volatile Petroleum Substances (VPS) in GW within 10 feet of building and within 10 feet of ground surface	≥ 10 x applicable GWVC	22a-6u(e)
Volatile Organic Substances (VOS) in GW within 30 feet of building and within 30 feet of ground surface	≥ 10 x applicable GWVC	22a-6u(e)
Soil vapor beneath building – VPSs and VOSs	≥ 10 x applicable SVVC	New
Indoor air not due to current process/material use – VPSs and VOSs	Criteria not yet defined	New
GW within 500 feet of surface water	NAPL present or ≥ 10 x SWPC	22a-6u(f)

SIGNIFICANT EXISTING RELEASES (“SERs”) – DRINKING WATER WELLS

Actions required for SERs in a **drinking water well**:

- Ensure that water contaminated by the release is not consumed, which may mean providing another source of drinking water
- Install physical barriers to prevent further migration of plume
- Within 2 days of discovery:
 - Identify & sample drinking water wells on adjacent parcels located within 500 feet of impacted well
- Within 15 days of discovery:
 - Identify & sample drinking water wells within 200 feet of impacted well; 500 feet downgradient of an impacted well
 - Submit an immediate action plan to DEEP



IMMEDIATE ACTION PLAN FOR DRINKING WATER WELL

- List of all drinking water wells identified and tested, specifying which wells were impacted by the release
- Schedule for sampling parcels adjacent to impacted drinking water wells until all impacted drinking water wells are identified
- Identify and describe an appropriate treatment system (installation in 15 days) or a connection to a public drinking water source (within 30 days) for each well impacted at concentrations $>GWPC$
- Schedule for the treatment system maintenance and monitoring
- Schedule for quarterly monitoring of all wells impacted at concentrations $\leq GWPC$ or within 200 feet of an impacted well
- Describe measures taken or to be taken to prevent further migration and a schedule for implementation and maintenance of such measures



SIGNIFICANT EXISTING RELEASES (“SERs”) – GROUNDWATER NEAR DRINKING WATER WELLS

Actions required for SERs for impacted groundwater present in a groundwater monitoring well within 500 feet of a drinking water well:

- Prevent further migration as soon as practicable
- Identify and sample all drinking water wells:
 - on adjacent parcels – within 2 days
 - within 200 feet of impacted monitoring well or 500 feet downgradient of impacted well – within 15 days
- If impacts to drinking water wells are discovered, complete actions for SERs in drinking water wells.
- Within 15 days submit an immediate action plan to DEEP



Immediate Action Plan For Groundwater



- List of all drinking water wells identified, sampled and impacted by the release and provide laboratory analytical results.
- Lists each drinking water well within 200 feet of an impacted public or private drinking water well, or within 500 feet downgradient of a groundwater monitoring well and groundwater plume exceeding GWPC and specific a schedule for the sampling of the wells.
- A schedule for quarterly monitoring of groundwater reported at concentration greater than GWPC.
- A description of the measures already undertaken, or to be undertaken to prevent further migration of the release, including a schedule for periodic testing and a schedule to implement, maintain and monitor any measures taken.

SIGNIFICANT EXISTING RELEASES (“SERs”) – SOIL

Actions required for **SERs discovered in soil**:

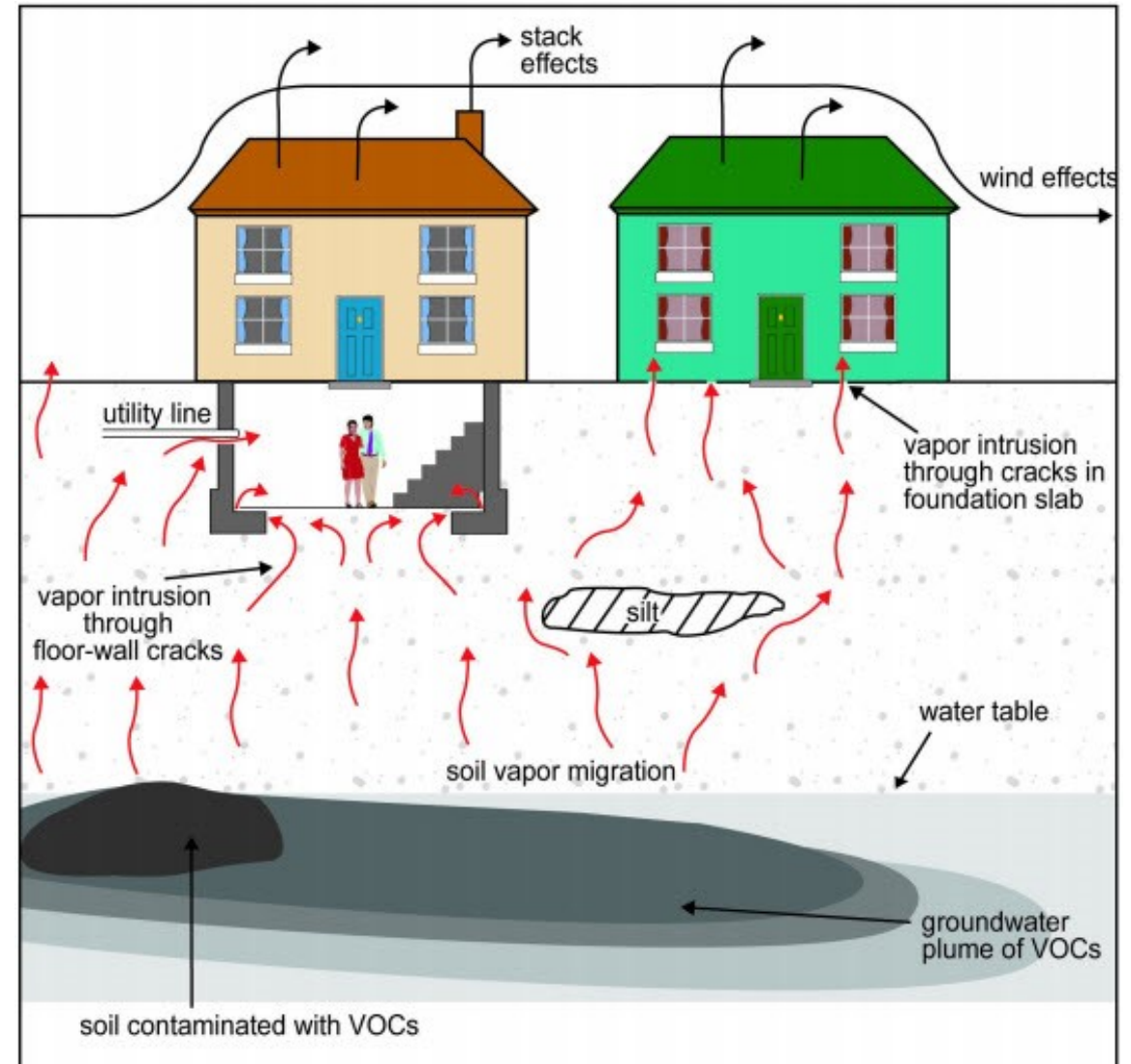
- Within 45 days:
 - Determine location and extent of impacted soil
- Within 90 days:
 - Remediate all impacted soil to the applicable DEC
 - Remove or mitigate soils to prevent exposure and submit immediate action plan
 - Render soils inaccessible (as defined in RSRs)
 - Remediate soil impacted by PCBs as required by 40 CFR 761



SIGNIFICANT EXISTING RELEASES – VAPOR INTRUSION*

Actions required for **SERs for Volatiles**:

- Ventilate the building to the maximum extent practicable (if building is occupied or in use)
- Submit Immediate Action Plan that:
 - Describes nature and extent of release and includes lab results
 - Specifies a vapor mitigation system to be used or installed (e.g., sealing cracks, sub-slab depressurization system, soil vapor extraction system)
 - Provides a maintenance and monitoring schedule for vapor mitigation system
 - Describes measures already undertaken or to be undertaken to prevent further migration of the release and a schedule for further actions



*This is in addition to soil and groundwater SERs that may be required

SIGNIFICANT EXISTING RELEASES ("SERS") – SURFACE WATER

Actions required for **SERs to surface water**:

Submit a report that includes:

- Measures taken to prevent migration
- Schedule for completing tier characterization





THANK YOU!

Please submit any questions within 7 business days to DEEP.Cleanup.Transform@ct.gov.



BACKGROUND FOR RELEASE DETERMINATION

(NATURAL METALS IN SOIL)

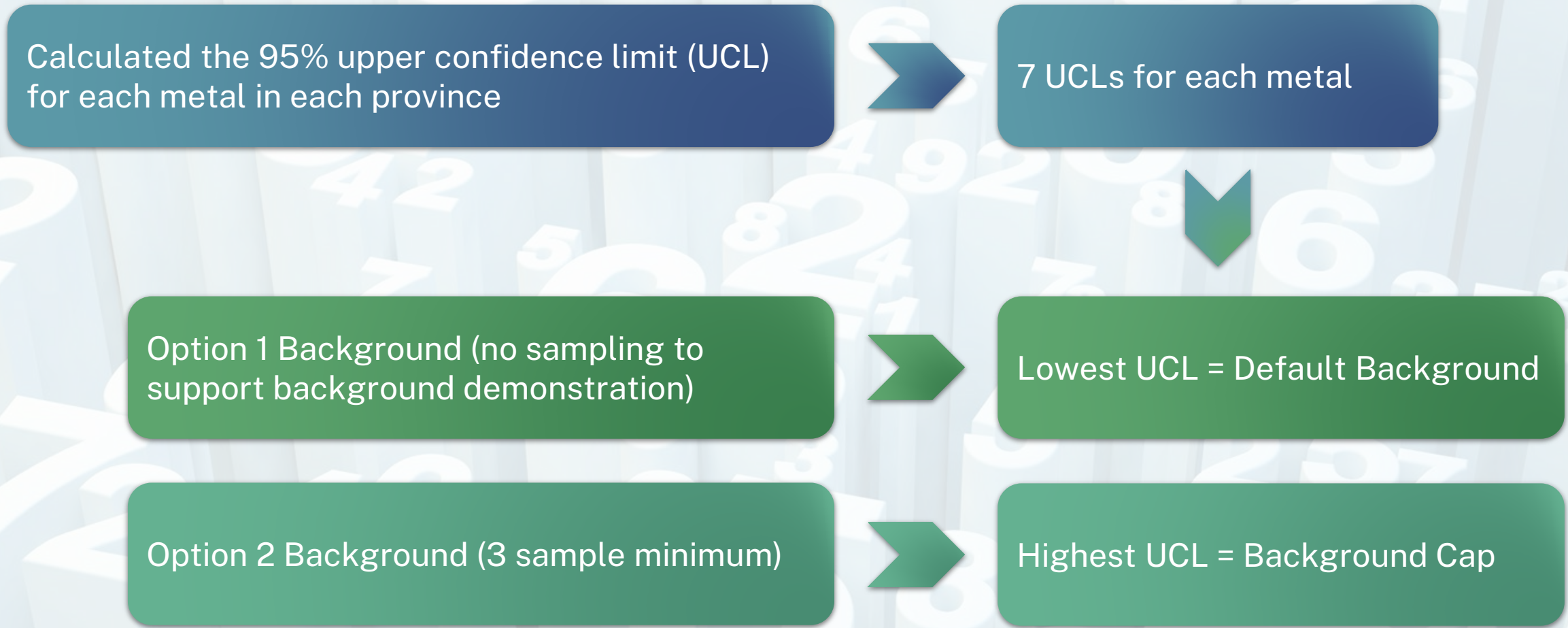
Background Team: Rosemary Gatter-Evarts, Carl Gruszczak, Kevin Neary, Katie Nee, Amber Trahan, Gary Trombly, Kevin Vanderveer, Peter Zaidel
Bureau of Water Protection and Land Reuse

OVERALL GOAL

Create an objective framework for determining if a release of metals to soil has occurred

- **No release = no reporting**
- **No release = no tiering**

STATE-WIDE BACKGROUND VALUES DETERMINATION



BACKGROUND DEFINITION

RSRs 22a-133k-1(a)(5) – “Background concentration” means the concentration of a substance in soil or groundwater* that, based on a validated conceptual site model, is:

- A. In the general geographic vicinity of a release; and**
- B. Either:**
 - i. Naturally occurring; or**
 - ii. Minimally affected by human influences at concentrations equal to or less than criteria specified in the RSRs.**

***This presentation addresses only soil.**

3 OPTIONS FOR DETERMINING NATURALLY OCCURRING BACKGROUND METALS

Option 1 – Default state-wide background

- **Baseline values**
- **No sampling required**

Option 2 – Site-specific background

- **At least 3 samples required**
- **State-wide upper limit**

Option 3 – Expanded site-specific background

- **More thorough evaluation**
- **LEP implementation or DEEP approval**

BACKGROUND OPTION 1

Default State-Wide Background, No Sampling

- Can be used by anyone
- Investigation data is compared directly to a default, state-wide background value
- A detection equal to or less than the default background is not considered a release


BACKGROUND OPTION 2

Site-Specific Background Limited Sampling, State-Wide Cap

- Can be used by anyone
- Requires collection of a minimum of 3 samples representative of naturally occurring background
- If all background samples are less than the state-wide upper limit, the highest background value from the data set may be used as site-specific background
- A detection equal to or less than background determined using this method is not considered a release

DERIVATION OF STATE-WIDE NATURALLY OCCURRING METALS VALUES

Options 1 and 2 are both tied to
state-wide values



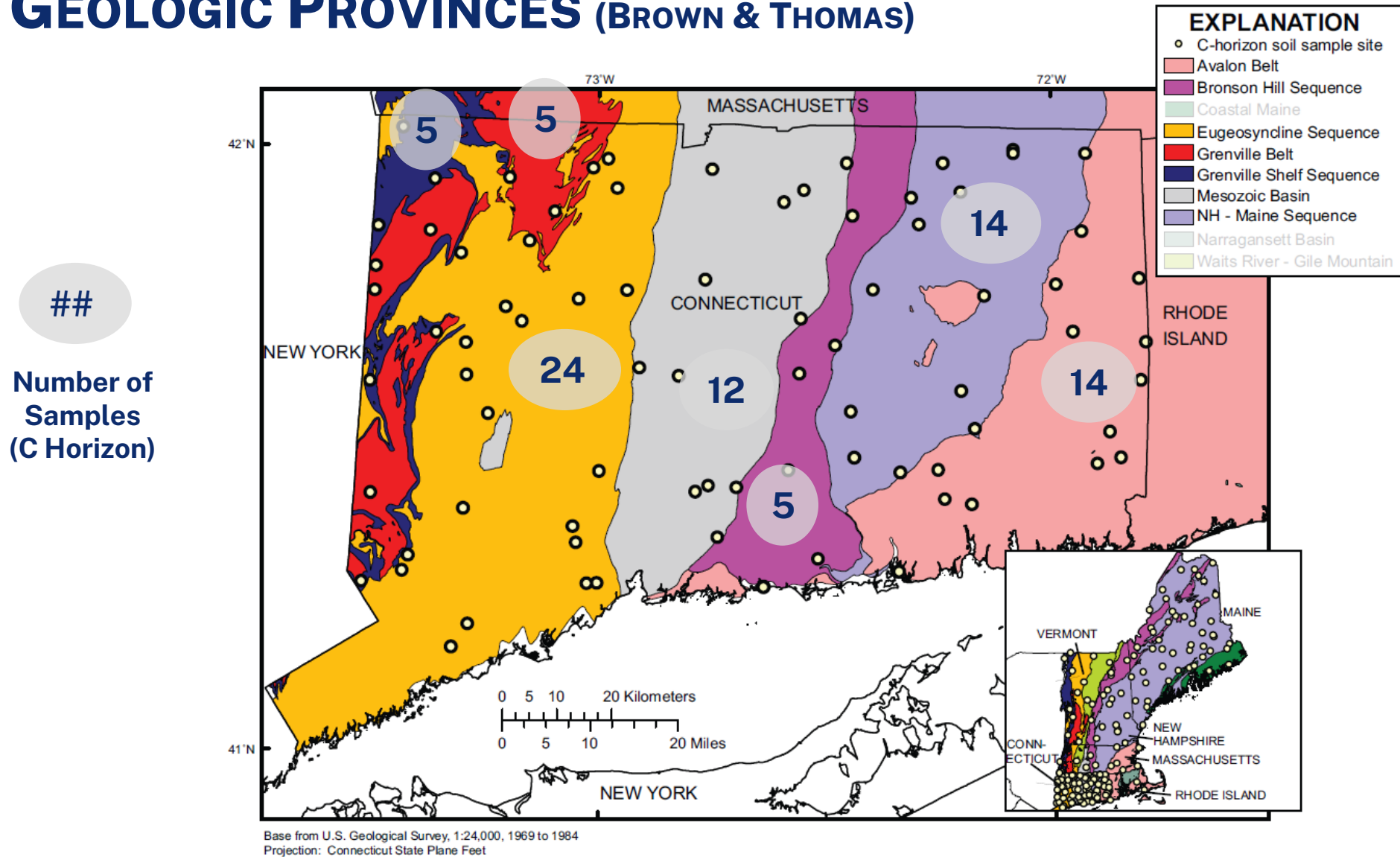
Major and Trace Element Geochemistry
and Background Concentrations for
Soils in Connecticut
(Brown & Thomas, 2014)

79 C
horizon soil
samples

7 geologic
provinces

43 metals
(trace element
analysis)

GEOLOGIC PROVINCES (BROWN & THOMAS)



SELECTED STATE-WIDE BACKGROUND METALS

Reference Metal	Option 1 Default (Low UCL) <i>(no sampling)</i>	Option 2 Upper Limit (High UCL) <i>(3 samples min)</i>	CT Res DEC
Arsenic	3	6	10
Barium	385	756	4700
Cadmium	ND	0.3	34
Chromium	31	60	100 (Cr ⁶)
Copper	17	45	2500
Lead	18	27	400
Mercury	0.03	0.08	20
Nickel	13	36	1400
Selenium	ND	0.8	340
Silver	ND	ND	340
Zinc	44	104	20000

Units = milligrams per kilogram

ND = non-detect

Beryllium and cobalt, (not shown) were capped at the Res DEC.

3 OPTIONS FOR DETERMINING NATURALLY OCCURRING BACKGROUND

Option 1 – Default state-wide background

- **Baseline values**
- **No sampling required**

Option 2 – Site-specific background

- **At least 3 samples required**
- **State-wide upper limit**

Option 3 – Expanded site-specific background

- **More thorough evaluation**
- **LEP implementation or DEEP approval**

BACKGROUND OPTION 3

Expanded Site-Specific Background Evaluation

- ❖ **LEP implementation or DEEP approval**
 - Background conceptual model supported by multiple lines of evidence
 - Minimum of 10 samples
- **LEP-implemented**
 - Evaluate and eliminate outliers
 - Calculate UCL
 - A calculated $UCL \leq Res\ DEC$ can be used as site specific background as long as it is supported by the data
- **DEEP-approval**
 - $UCL > Res\ DEC$
 - Alternate method used to establish background

SUMMARY



Option 1

- Can be used by anyone
- No additional sampling required
- Default statewide background

Option 2

- Can be used by anyone
- Minimum of 3 samples for background determination
- Use highest value from dataset if less than statewide upper limit

Option 3

- Requires LEP
- Minimum of 10 samples for background determination
- Eliminate outliers
- Calculate 95 UCL
- ❖ LEP-implemented:
 - Calculated 95 UCL is \leq Res DEC, use UCL as background
- ❖ DEEP-approval:
 - Calculated 95 UCL is $>$ Res DEC
 - Alt. method for background used

SUMMARY

**Metal Concentration
≤ Natural Background = No Release**

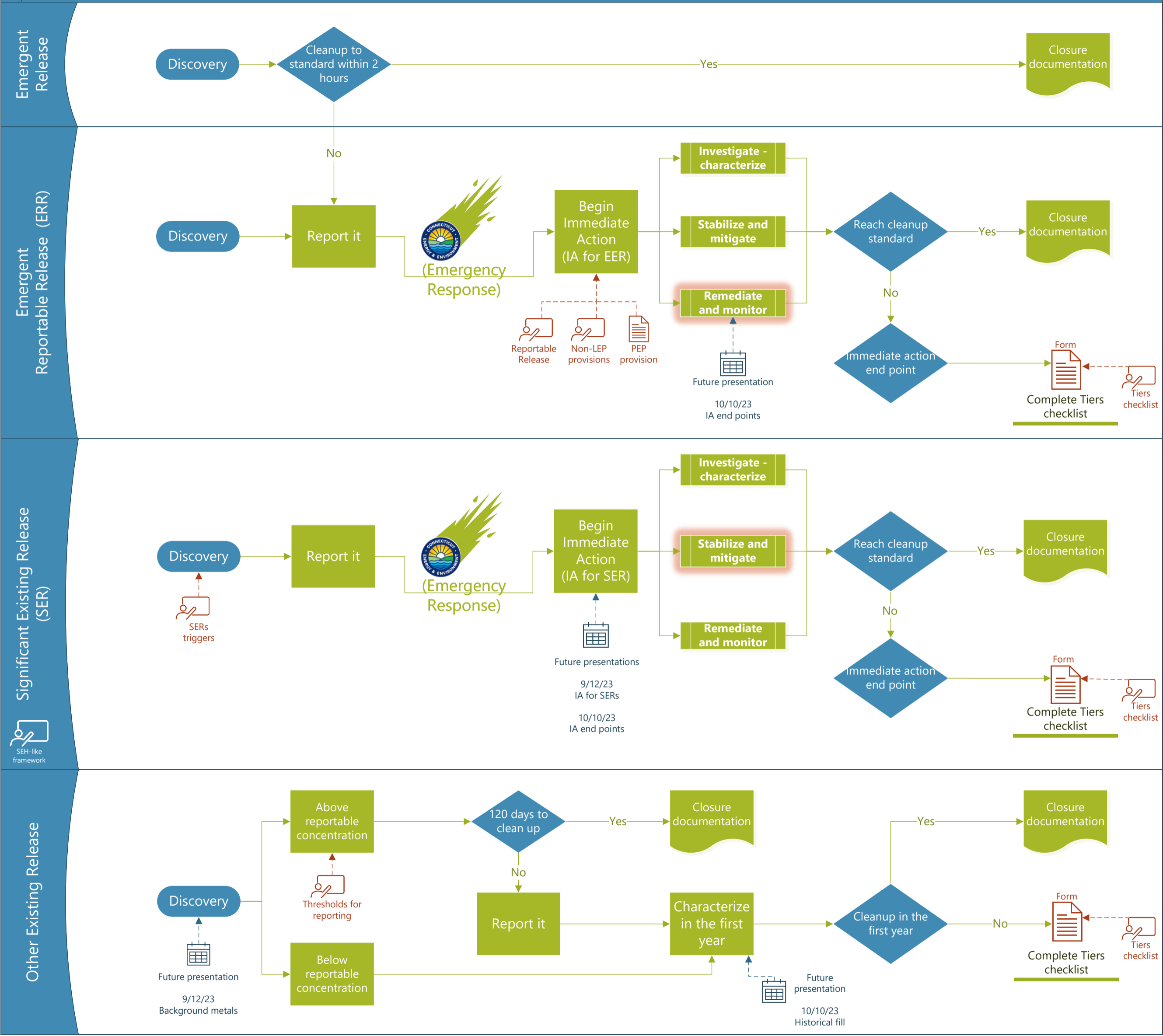
**If detections are determined to be background
within 120 days, no reporting necessary**



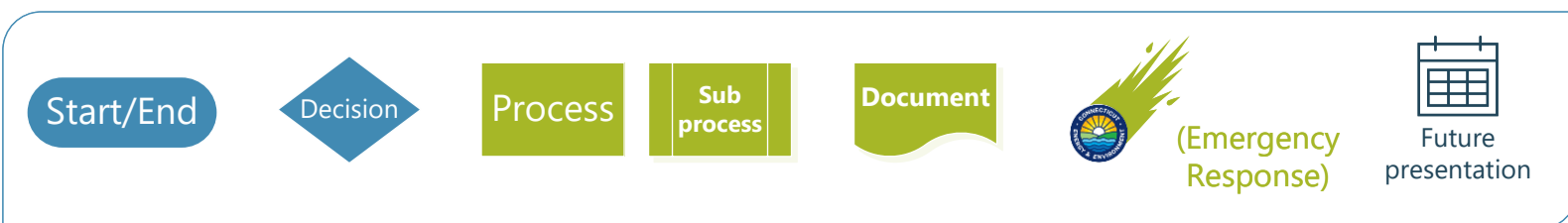
The End

Release-Based Cleanup

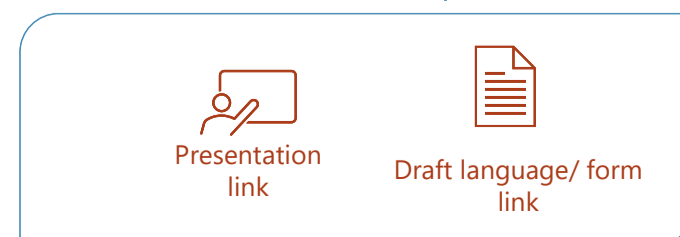
Interactive Roadmap to the first year after discovery



Flowchart shapes



Interactive shapes



(a) A release shall be determined to have satisfied the requirements of sections 22a-134tt-1 to 22a-134tt-XX of the Regulations of Connecticut State Agencies if:

(1) The approximate location and volume of such release was known at the time remediation was commenced;

Knowledge is necessary to direct the response, and will be necessary in determining that all soil impacted by the release has been removed

(2) The substance or substances released are known;

Necessary to determine compliance with this subsection (i.e.: whether it is oil or petroleum, its solubility, and its specific gravity.

(3) The release:

(A) did not occur in or directly to a surface water body and has not migrated to such surface water body; or

(B) occurred in or migrated to a surface water body, and each substance released is soluble or has a specific gravity of less than 1;

If the release contacted surface water, this provision assesses the likelihood of impacts to sediments.

(4) The release:

(A) has not contacted groundwater; or

This determination is made using the standards set out in subsection (c) below

(B) consists only of oil or petroleum, is not within 500 feet of a public or private drinking water well, and has not caused a persistent impact to groundwater as determined by subsection (d) of this section; and

This determination is made using the standards set out in subsection (d) below

(5) Remediation is commenced within the time specified by section 22a-134tt-5, and all immediate actions required by section 22a-134tt-5 are completed in the time specified by that section;

For Emergent Reportable Releases, remediation must commence as soon as is practicable and not later than 2 hours after discovery.

(6) Soil impacted by the release is removed for proper disposal; and

Those choosing to use these provisions must remove all impacted soil (rather than cleanup to a numeric criteria). This is the necessary trade off to allow PEP certification of completion. It is anticipated guidance on this point will be provided.

(7) A PEP certifies or an LEP verifies, pursuant to section 22a-134tt-XX of the Regulations of Connecticut State Agencies, that each of the requirements of this subsection has been satisfied.

This provision, which allows achievement of a cleanup standard with no, or only limited sampling, can be used by PEPs and LEPs

(b) For the purposes of determining compliance with subsections (a)(3) and (a)(4) of this section, a release was to a secondary containment system designed, installed and operated to collect and contain the release shall not be considered to have occurred in or directly impacted a surface water body or to have contacted or caused a persistent impact to groundwater, provided that:

Secondary containment functions as a shortcut for determining if surface or groundwaters are impacted by a release, provided the release remained in the secondary containment system, and that system was not damaged. If the release overtopped the secondary containment, or that system was damaged, the release can still be eligible for cleanup under these provisions, provided it satisfies (a)(3) and (a)(4) above.

(1) The volume of the release is less than the volume that the secondary containment system is designed, installed and operated to collect and contain, and the secondary containment system has contained such release;

(2) An assessment of the secondary containment system identifies no damage to such system. Such assessment shall include, but may not be limited to, a visual inspection of surfaces coated with epoxy or other coatings. The secondary containment system shall be determined to be damaged if cracks, voids, or gaps in the secondary containment system or any epoxy or other coating are identified; and

(c) For the purposes of determining compliance with subsection (a)(4)(A) of this section, a release shall be determined to have contacted groundwater if:

(1) (A) Groundwater is encountered in the course of excavating or removing the volume of soil necessary to remove soil impacted by the release; and

(B) One or more substances released is detected in a properly constructed and developed groundwater monitoring well located immediately downgradient of the approximate location at which the release occurred and not more than five feet from the edge of the area excavated for the purposes of remediation; or

(2) A substance or substances released is determined to be present in the groundwater using any other method or protocol specified by the commissioner by publishing such method or protocol on the department's internet website.

(d) For the purposes of determining compliance with subsection (a)(4)(B) of this section, a release of oil or petroleum shall be determined to have caused a persistent impact to groundwater if:

(1) A visible sheen remains on groundwater after three attempts within twenty four hours at removing the sheen by vacuum extraction of groundwater from an excavation or adjacent monitoring well;

(2) One or more of the substances released is detected in a properly constructed and developed groundwater monitoring well located immediately downgradient from the approximate location of the release and not more than five feet from the edge of the area excavated for purposes of remediation 24 or more hours after completion of the excavation of the soil impacted by the release; or

(3) A substance or substances released is determined to be present in the groundwater using any other method or protocol specified by the commissioner by publishing such method or protocol on the department's internet website.

A release is determined to have contacted groundwater if groundwater is encountered while excavating *and* the release is found in the monitoring well described here. If groundwater is not encountered while excavating, no monitoring well is required.

"Properly constructed and developed" will be defined to include standards for the construction, design and installation of the well.

This provision is purposefully prescriptive regarding the location of the well.

The Department may specify additional sampling or other protocols to be used in specific instances using guidance-like documents (similar provision at (d)(3)).

A release of oil or petroleum is determined to have persistently impacted groundwater if a sheen remains or if it is found in the monitoring well described here. A monitoring well is always required to use this provision.