

RCRA Compliance at Cleanup Sites: Area of Contamination and Contamination in Environmental Media

A NEWMOA Waste Site Cleanup Group
Webinar



November 13, 2019
10:00 - 11:30 a.m.

Responsibilities of the Generator



- Fully and properly characterize the waste.
 - Ultimately the responsibility of the generator.
 - Not the transporter, disposal facility, consultants, etc.
- If the waste is hazardous, manage it in accordance with all applicable hazardous waste requirements.
- “Co-generators” are jointly and severally liable for compliance.
 - Property owner or operator (e.g., lessee).
 - Remediation consultant (e.g., LSP, LEP, etc.).
 - Remediation contractor(s).

Is Your Remediation Subject to RCRA

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- If hazardous waste was generated (after 11/19/1980) then released, it is regulated.
- If waste is excavated or pumped out of the ground, it is regulated. It is regulated under RCRA if it:
 - Exhibits a hazardous waste characteristic (ignitability, corrosivity, reactivity or toxicity)
 - Contains a listed hazardous waste (i.e. spent TCE solvent). This is based on origin, not concentration.
 - Meets the state specific definition of hazardous waste (i.e. PCB)
 - A waste could be non-hazardous in its origin state but hazardous in the destination state.

Basis of Determination

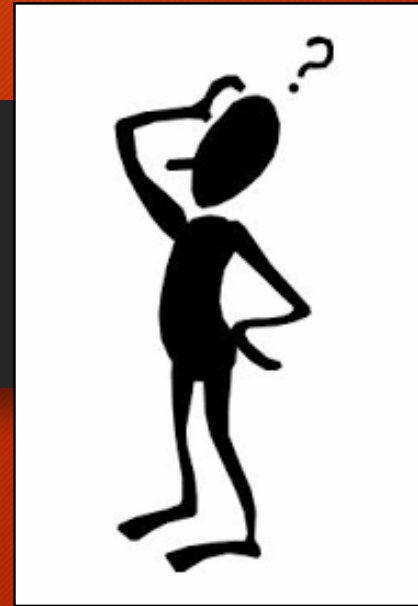
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- Determination can be based on:
 - Analysis
 - Process knowledge
- Therefore, the less you know about the process the more analyses you may need to make a determination.
- Soil and groundwater subject to hazardous waste (and solid waste) determination when you dig them up.
- Some states allow you to do exploratory test pits and then immediately put waste back in the hole.
- If you remove and stockpile waste, may have to manage it under RCRA



Listed vs. Characteristic Waste:

Listed Waste (Cont.)



- What if you don't know what the source of the contaminant was?
 - If, after good faith efforts to determine whether or not the source contaminant is listed, documentation is unavailable or is inconclusive, it is not necessary to assume that it is listed.
- What if you don't know when the contamination happened?
 - Similar approach.
 - If, after good faith efforts to determine date of contamination, you are unable to do so because documentation is unavailable or inconclusive, it is not necessary to assume that the contamination is listed.
- “Documentation” = manifest data, inspection reports, company & town records, former employees, etc.

Treating Listed Hazardous Waste

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- Soil or groundwater is only a characteristic hazardous waste if it exhibits the characteristic (ignitability, corrosivity, reactivity or toxicity)
- In theory 1 molecule of listed hazardous waste mixed with 100,000 yards of soil is 100,000 yards of listed hazardous waste.
- Once it is listed hazardous waste, it is subject to Landfill Disposal Requirements (LDR's) including LDR Treatment Standards
- LDR treatment standards are either performance based (concentration) or technology based.
- May need a permit corrective action authorization to treat this waste.

Requirements for Treatment of Contaminated Environmental Media



- General rule: treatment of hazardous waste requires a RCRA permit.
- Notable exceptions may include:
 - Treatment of waste that has been “contained-out” (no longer HW).
 - Treatment in accordance with the AOC Policy (not generated yet).
 - Generator treatment in tanks or containers (check with your state for specifics).
 - Treatment in RCRA-exempt wastewater treatment units.
 - Treatment in authorized CAMUs or TUs.

Other Kinds of Permits may be Needed

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- Treatment of non-hazardous media may require a state permit.
 - Example: mobile soil treatment company.
- Air or Water permits may also be required in some cases.
 - Examples:
 - Soil venting may require air discharge permit
 - groundwater pump and treat systems may require:
 - UIC (Underground Injection Control)
 - Wastewater discharge permit
 - RIPDES surface water discharge permit

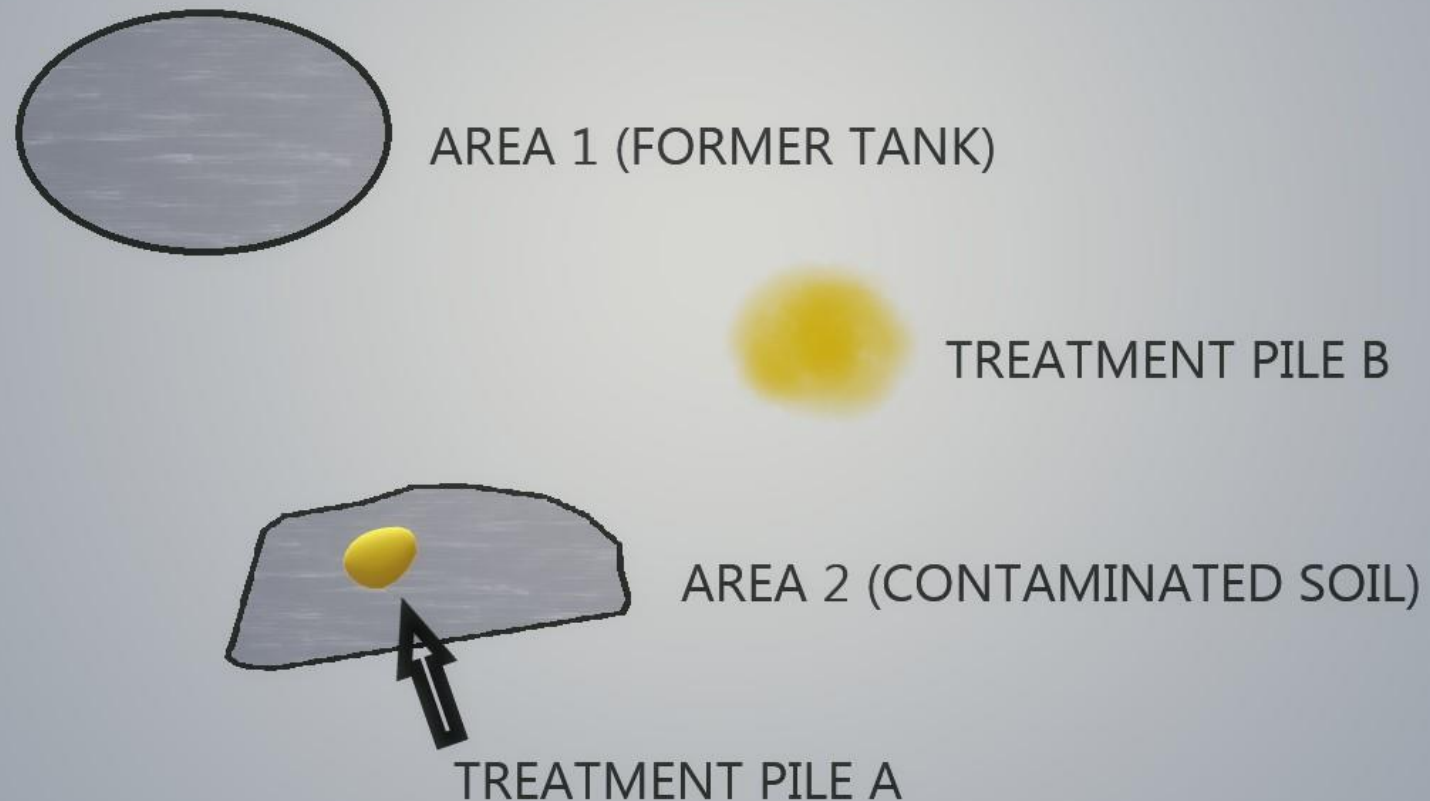
“Area of Contamination” Policy

- EPA policy supported by most NEWMOA States (check w/ your state).
- AOC = a single, contiguous area of continuous contamination.
- Policy allows certain activities to occur within the AOC without triggering “generation” and the associated RCRA treatment and LDR requirements:
 - Consolidation of waste within the AOC.
 - In-situ treatment within the AOC.
- Does not cover:
 - Movement of waste outside the AOC.
 - Movement of waste between AOCs.
 - Ex-Situ treatment.



Areas of Contamination

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1. Movement or in-situ treatment of area 2 soils in treatment pile A- allowed
2. Stockpile of Area 2 soils in pile A for transport off-site allowed.
3. BUT...
4. Treatment of Area 2 soils in treatment pile B- not allowed.
5. Treatment of Area 1 Soils in Treatment Pile A- not allowed.

Area of Contamination

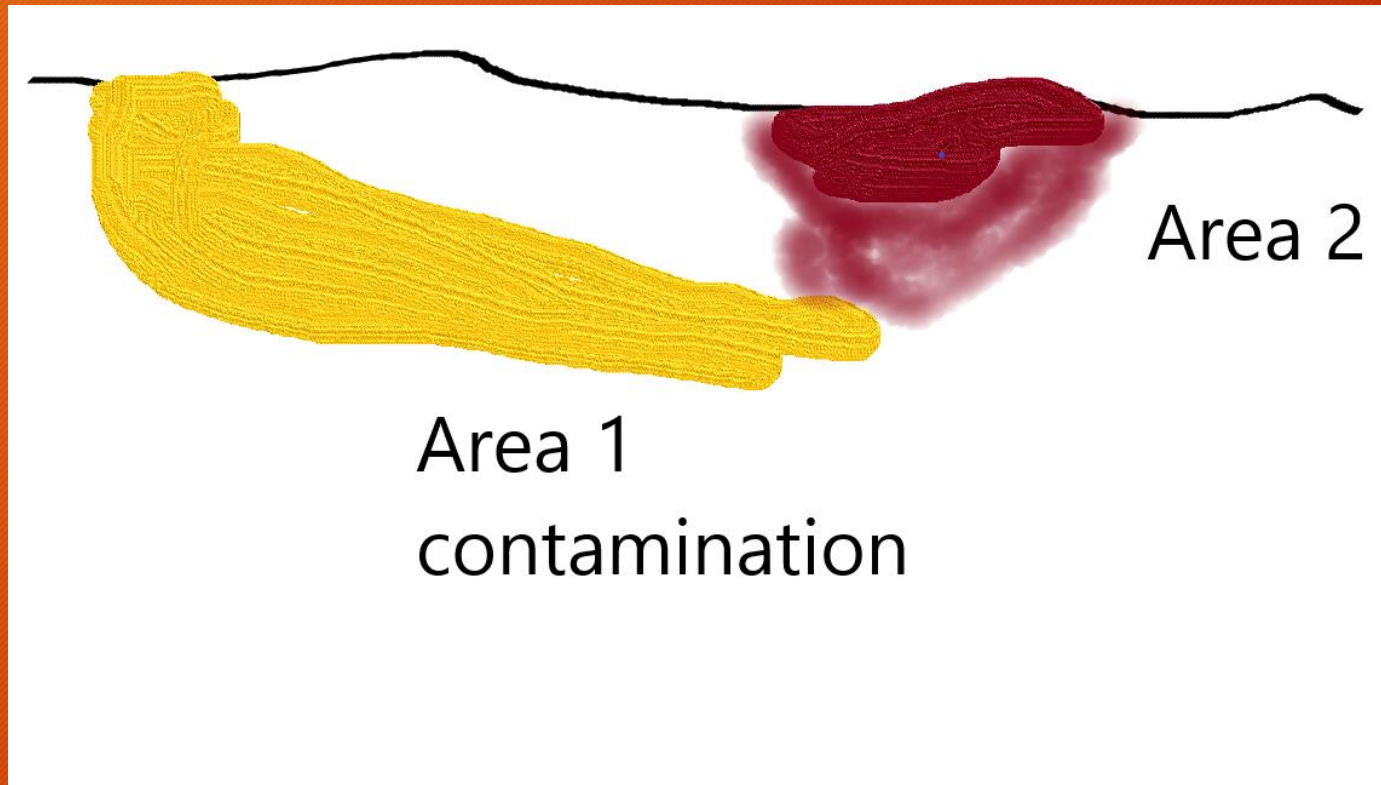
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- Is not dependent on property boundaries
- Is based on contamination at surface and depth

Area of Contamination is Defined in 3D

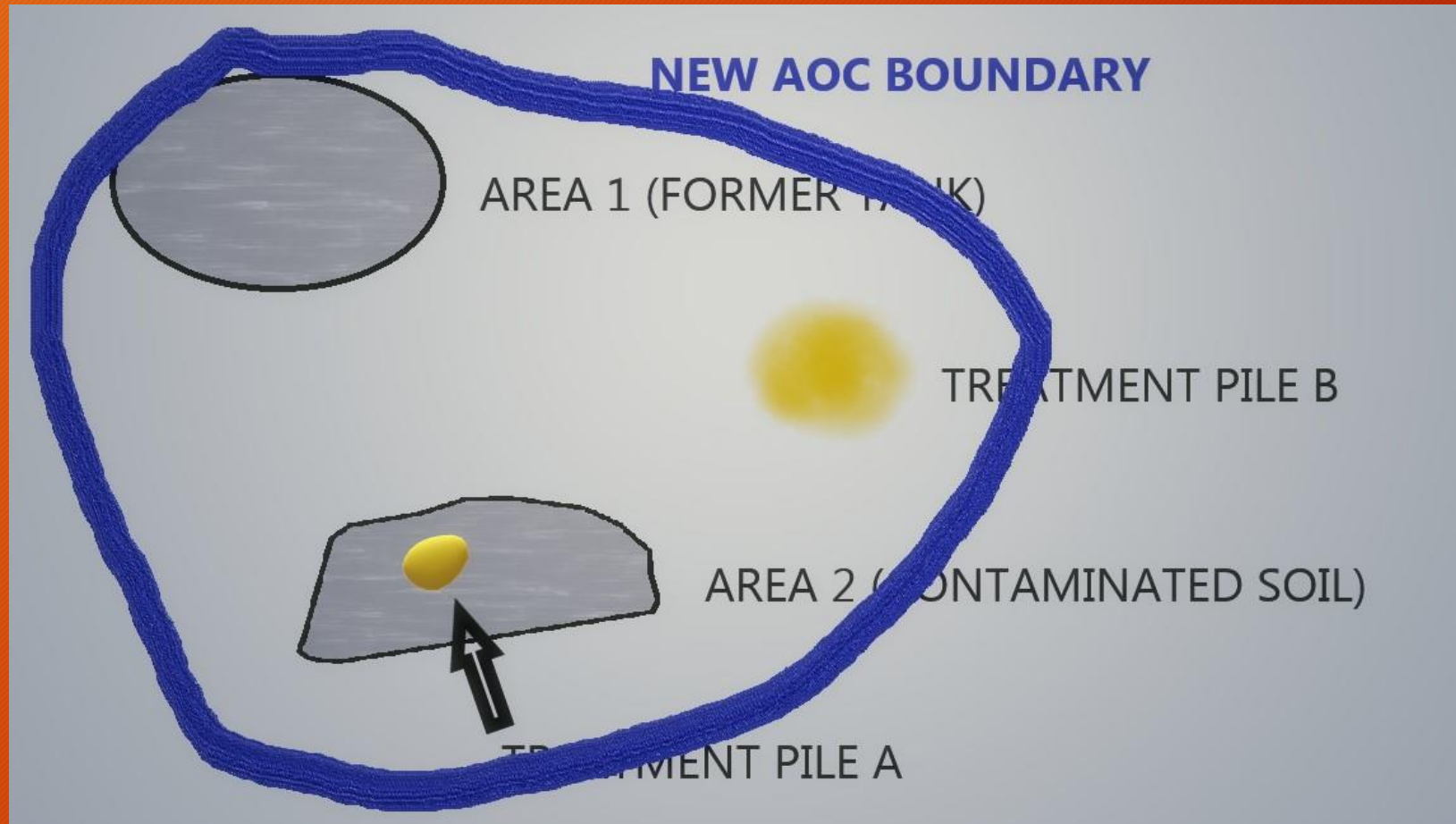
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CROSS SECTION OF PREVIOUS SKETCH



CONTAMINATION AT DEPTH CHANGES AREA OF CONTAMINATION DELINEATION

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NEXT STEP BEYOND AREA OF CONTAMINATION

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- Treatment of hazardous waste outside of Area of Contamination requires a RCRA Permit or one of the following authorized mechanisms:
 - Staging Piles- temporary storage of materials- no treatment
 - Temporary units- resembles treatment in tanks or containers
 - Corrective Action Management Units (CAMU's)- this can be a Disposal CAMU (landfill) or a treatment CAMU for remediation units (reactive slurry wall)

CORRECTIVE ACTION MANAGEMENT UNITS (CAMU)

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- Disposal CAMU- cap, liner, leachate collection system, a.k.a.- landfill
- Treatment and Storage CAMU
 - Treatment over a limited time with no waste left in place.
 - If treatment over 2.5 years, must meet disposal CAMU standards.
 - Consolidation of waste does not trigger LDR's

Contained in Policy

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“Contained-in” Policy for Contaminated Environmental Media



- States are authorized to make “Contained-out” for environmental media that it may be considered to no longer contain listed hazardous waste.
- Based on health based standards promulgated by the state.
- All of the NEWMOA states have established such criteria.
- Many NEWMOA states may require formal approval of a “contained-out” determination prior to disposal in their state.
 - Often this is NOT delegated to licensed professionals.
- This can apply to soil, groundwater or sediment

Example- TCE In Soil

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- TCE in soil at 8 mg/kg total. (need to convert units)
- $8 \text{ mg/kg} / 20$ estimated 0.4 mg/l TCLP (or you could do TCLP)
- RCRA D040 Regulatory level= 0.5 mg/l
- Soil does not exhibit D040 characteristic of haz waste
 - But...
- Dry cleaner located at the site
 - If they closed in 1979, listing does not apply, not RCRA haz waste.
 - They operated from 1982-1988 F002 listing for spent solvents containing TCE applies.

TCE Example Continued

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Site Remediation Standards for TCE

- Residential Direct Exposure- 12 mg/kg
- Industrial Commercial Direct Exposure- 110 mg/kg
- GA leachability standard for TCE- 0.2 mg/kg
 - GA areas are where groundwater is presumed to meet drinking water standards
- GB Leachability standard for TCE- 20 mg/kg
 - GB is areas of presumed degradation

TCE Example

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- Soil at 0.1 mg/kg < RDEC AND < GA standard- can get Contained Out letter to exempt it from RCRA.
- Soil at 8 mg/kg < RDEC BUT > GA standard- AND < GB - Contained Out letter OK if going for grading and shaping material at landfill in GB area.
- TCE at 525 mg/kg above I/C standards not suitable for Contained Out determination.

How Management within AOC Could Affect Standards

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- Remediation Goals usually linked to state cleanup standards and targets.
 - For TCE 20 mg/kg= GB leachability standard (GA would be 0.2)
- For contaminated soil, 90% reduction capped at 10 times universal treatment standard.
- UTM for TCE is 6.0 mg/kg
- If soil contaminated at 30 mg/kg, LDR Treatment Standard is 3.0 mg/kg
- If managed under AOC, standard would be 20, if not, LDR is 3.0

What Standards Apply

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- Using RI as an example
- If contaminant levels in soils are below residential standards, it is pretty clear that contained in determination can be made treatment is no longer needed.
- *If contaminant levels are above Industrial/Commercial standards, contained in determination cannot be given as more treatment is needed.*
- *Contaminant levels >residential < Ind/Commerical then contained in determination can only be made if final destination compliant with standards (i.e. deed restriction, solid waste landfill).*
- *Similar process for groundwater, surface water and sediments.*

Timing is Everything

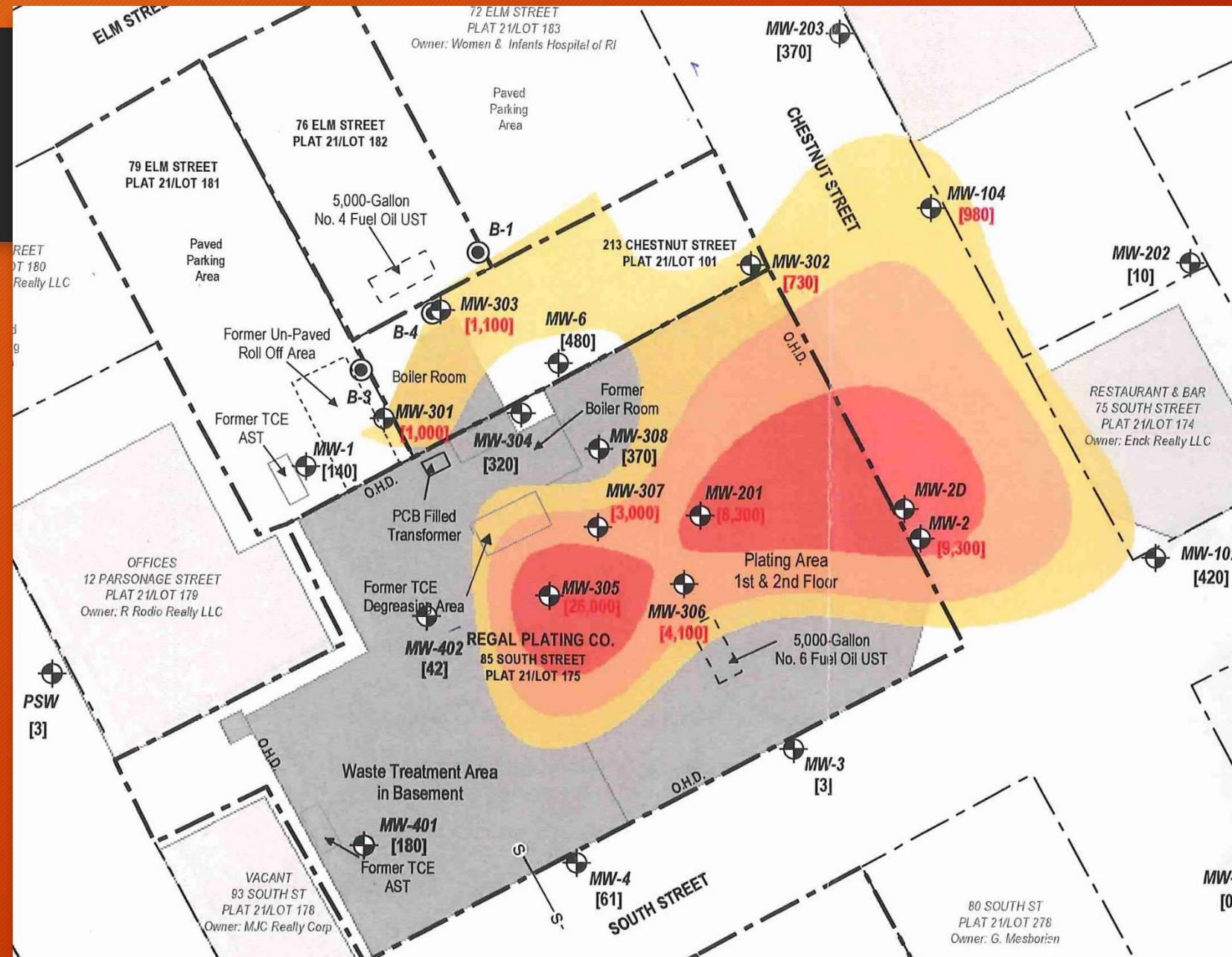
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- Timing of “contained-in” determination is important:
 - If performed before “generation” → was never a hazardous waste.
 - If performed after “generation” → was a hazardous waste up until the determination was completed (would have required RCRA compliant storage, labeling, etc.).
 - Important for applicability of LDRs (more on this later).



Regal Plating Providence

- TCE Plume
- Operated 1950-2003
- Release of TCE and Cyanide et.al.
- Placement and removal of tanks when overlaid with plume gives an idea of timing of release.
- Contained-out based on information provided
- Soil met I/C Standards Disposal at RIRRC as alternate daily cover
- Material above I/C Standard disposed of as haz waste.



Regal Plating- Management of Soils

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- Generator determined some release of listed waste
- Impacted soils divided into 2 piles:
- 80 cubic yards TCLP > 0.5 mg/l disposed of as hazardous waste at a licensed RCRA TSDF.
- 120 cubic yards of moderately impacted soils.
 - Below TCLP limits in our Hazardous Waste Regulations
 - Contamination above GA leachability and Residential Direct Exposure Limits
 - Contamination below GB leachability and Industrial/Commercial Direct Exposure standards Used as alternate daily cover

Source: Resource Control Associates Site Investigation 2008

Examples/Case Studies



LESSONS
LEARNED

- 1) Soil excavated, placed in a pile outside the AOC, and not discovered to be hazardous until sample results came back.
- 2) Soil w/ listed solvents excavated and placed in roll-offs, “contained out,” and sent to a SW LF, but did not meet LDRs.
- 3) Wood-block flooring not discovered to be contaminated with a listed solvent until removed and staged in outdoor piles.

Waste Characterization Should Be an Integral Part of Site-Wide Project Management

- Tempting to focus on cleanup and worry about characterization later.
- Allows Law of Unintended Consequences to kick in:
 - Enforcement actions/penalties.
 - Unexpected need for approvals/permits.
 - Unnecessary delays and cost overruns.
- Opportunities to minimize disposal cost can be missed:
 - Timing of “Contained-in” determinations.
 - Contaminated soil management and staging.
 - In-situ vs. ex-situ treatment.
- Consider including a RCRA expert in the project design.
 - In-house.
 - Contracted out.



More Information

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- Area of Contamination Policy

https://www.epa.gov/sites/production/files/2016-04/documents/02_01aoc.pdf

EPA Corrective Action Training Module

<https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-training-module-about-corrective-action>

Questions?



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