

# Remediation

OAC 3745-300-11

Certified Professional  
8-Hour Training

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# Overview

- VAP remediation requirements
- Complete pathways to off-property receptors
- Types of remedies
- Documentation of remedies
- Changes to remedies
- Technical guidance documents



# Background

- Phase II = identify COCs
- Applicable risk goals
  - Excess cancer =  $1 \times 10^{-5}$
  - Excess non-cancer = 1
- Decision for remedy if risk goals are exceeded



# Conducted when COCs do not comply with:

- Generic standards (Rule 08)
- PSRA standards (Rule 09)
- Background levels (Rule 07)
- Any other applicable VAP standard



# Pathway omission

- The statute specifies that the CNS covers all releases, including those that have left the property
- Volunteer must demonstrate diligent efforts to implement remedy to off-property receptor
- If unable, pathway can be omitted



# Pathway omission process

- Determine off-property receptors
- Determine potential pathways
- Provide each property owner written notice of potential pathways and potential associated risks



# Pathway omission process

- Explain to owner activities that may be employed as part of the investigation
- Offer to pay all costs
- Document all discussions/correspondence with owners where they refused the remedy
- Document any other reason that prevented installation of remedy



# Requesting the pathway omission

- Must be done before NFA letter is issued
- Must document all the steps outlined in the process
- Must incur the costs of the agency review
- The agency will generally approve a request within ninety days after receipt





# Interim Measures

- Property not meeting applicable standards prior to issuing an NFA letter
- Conducted prior to remedy achieving applicable standards
- Must be protective of human health and environment



# Types of remediation

- Active remediation
- Passive remediation
- Institutional controls
- Engineering controls



# Active Remediation

- Reduces mass, toxicity, or mobility of COC
- Most common is soil removal



# Passive Remediation

- Remedial activities relied upon as in situ natural methods and **documented in peer-reviewed scientific literature**, which reduce the mass, toxicity, mobility or concentration of a chemical of concern over distance and time through natural attenuation processes



# Natural attenuation processes

- Adsorption
- Absorption
- Advection
- Dispersion
- Diffusion
- Dilution from recharge
- Volatilization



# Other types of natural attenuation

- Aerobic biodegradation
- Anaerobic biodegradation
- Chemical oxidation processes
- Hydrolysis and other reactions



# Monitored natural attenuation

- Natural attenuation conclusion must be supported
- Standards met during a certain time frame



# Institutional Controls

- Established by recording deed restriction
- Transferable
- Eliminates or mitigates exposure to hazardous substances or petroleum
- Monitored, maintained, and enforced





# Engineering Controls

- Relies on its ability to block a complete exposure pathway
- Must be reliable for the climatic conditions and activities at the property to which the control will be applied
- Monitored and maintained per operation and maintenance plan



# Examples of Engineering Controls

- Pavements acting as barrier caps
- Soil caps to eliminate direct contact to chemicals or prevent groundwater contamination
- Foundations and building floor slabs
- Sub-slab vapor diversion systems



# Risk Mitigation Measures and Risk Mitigation Plans

- Contained in risk mitigation plan
- Implemented as
  - Condition of covenant, or
  - Within O&M plan
- Must have periodic reporting



# Risk Mitigation Measures

- Needed when there is potential exposure to construction workers before or after issuance of NFA
- Apply if POC is breached
- Safety precautions to mitigate or eliminate human exposure



# Risk Mitigation Measures

- Documented in risk mitigation plan if measures are necessary for the property to meet applicable standards after issuance of the no further action letter



# Documentation of remedial activities

- Environmental covenant
- Risk mitigation plan
- Operation and Maintenance Plan



# Environmental Covenant

- Required for “environmental response projects” with institutional controls
- Applies to properties with NFA letters that request a CNS
- Institutional controls = Activity and Use Limitations (AULs)



# Environmental Covenant

<http://epa.ohio.gov/derr/volunt/volunt.aspx>



The screenshot shows a website navigation menu with the following tabs: 'What's New', 'Program Info/Services', 'How Do I?', 'Links and Resources', and 'Contacts'. The 'Program Info/Services' tab is selected. Below the tabs, the heading 'Information & Services' is followed by a list of links:

- [BUSTR Class C and Class D Releases are Now Eligible for the VAP](#)
- [Fees](#)
- [Guidance](#)
- [Rules](#)
- [Technical Guidance Compendium](#)
- [Evaluation of Background Metal Soil Concentrations](#)

Below these links are three expandable sections:

- ▶ Certification
- ▶ Financial Assistance/Incentives
- ▶ Memorandum of Agreement (MOA) Track

At the bottom is a collapsed section:

- ▼ NFA Information, Process & Procedures





# Environmental Covenant

- CP must submit draft with NFA Letter
- Should discuss language with VAP prior to issuance of NFA
- CP should discuss implications of AULs with Volunteer
- Recordation of environmental covenant within 30 days of CNS issuance



# Risk Mitigation Plan

- Required if the risk mitigation measures are necessary for the property to meet applicable standards after issuance of the NFA letter



# Risk Mitigation Plan Contents

- Purpose of the plan, including summary of potential health risks
- Specific precautions against exposure
- Directions on how to handle environmental media
- Locations on property where plan will be implemented



# Risk Mitigation Plan Contents

- Provisions for when the plan will be implemented
- Provisions for notifying construction workers
- Summary explanation of precautions
- Annual notification provisions
- Criteria for termination



# Operation and Maintenance Plan

- Required when:
  - Engineering control is employed
  - Any remedial activity not completed prior to NFA issuance



# Operation and Maintenance Plan Contents

- Summary of applicable standards
- Plan for implementation
- Plan for evaluating effectiveness
- Description of equipment
- Plan for adjustments



# Operation and Maintenance Plan Contents (cont.)

- Address potential problems
- Placeholder for keeping records
- Plan for termination of remedial activities



# Operation and Maintenance Plan Reporting

- At least annually
- Demonstrate efficacy of remedy
- Report on contingency measures
- Confirm remedy is still in place





# Operation and Maintenance Agreement

- Generic template available through VAP
- O&M plan and agreement must be submitted with NFA Letter
- O&M agreement negotiated after submittal



# Changes to the remedy post-CNS

- Volunteer may choose to change the remedy
- Collect data necessary to support new remedy
- Maintain existing remedy until the new remedy is implemented



# Remedy revision notice

- Description of remedial activities
- Statement from CP that property meets applicable standards
- List of information used to justify new remedy
- Description of new remedy
- New environmental covenant or O&M plan, as applicable



# Remedy revision acknowledgment

- Agency does not review remedy
- Property can be considered for compliance audit
- TA account must be opened if O&M plan, agreement or environmental covenant changes



# Remedy revision approval

- Volunteer opens a TA account for the cost of agency review and approval letter
- No compliance audit expectations



# Technical decisions relating to remedies

- [http://epa.ohio.gov/portals/30/vap/tgc/TGC\\_Index.pdf](http://epa.ohio.gov/portals/30/vap/tgc/TGC_Index.pdf)
- Archived decisions available for informational purposes only
- Four relate to remedies



# Passive remedy for potential future exposure scenarios

- Passive remedy can be implemented to protect on and off-property receptors
- Requires O&M plan
- CP must demonstrate that the remedy is appropriate for site



# Injection wells

- Formal injection permit may not be necessary if fluids do not exceed standards
- CP must apply and receive 5X26 exemption for remedial projects
- More information found at:  
<http://epa.ohio.gov/ddagw/UIC.aspx>





# Hazardous Waste Reporting Requirements

- Comply with annual reporting requirements found in 3745-52-41 if Volunteer:
  - Generates 1000 kg hazardous waste/month (or subject to 3745-52-34) and,
  - Ships hazardous waste off-site



# Hazardous Waste Reporting Requirements

Further information:

- <http://epa.ohio.gov/dmwm/Home/HWAnnualReportProgram.aspx>
- Division of Materials and Waste Management – (614) 644-2917



# Fence as a Remedy

- **Q:** Fence = engineering or institutional control?
- **A:** Fence = engineering control



# Fence as a Remedy

- CNS is void if fence is damaged or compromised and is part of AUL
- Opportunity to cure if fence is damaged or compromised and is part of engineering control



# Fence as a Remedy

- Numerous scenarios for fence to be compromised
- Fence within engineering control allows volunteer to inspect and repair; avoiding CNS voidance



# Remedy Top Mistakes List

- ❖ No remedy implemented in absence of O&M plan
- ❖ No O&M for engineering control
- ❖ Slab or foundation omitted as engineering control



# Remedy Top Mistakes List

- ❖ Construction worker risk not mitigated
- ❖ No Risk Management Plan included
- ❖ Effectiveness of remedy not documented



# Remedy Top Mistakes List

- ❖ Disposal media not properly characterized
- ❖ Remedy implementation not documented





# Remedy Top Mistakes List

- ❖ Deed restrictions not recorded
- ❖ Insufficient sampling data
- ❖ Financial assurance mechanism not included in O&M agreement



# Remedy Top Mistakes List

- ❖ Failure to implement applicable response requirements
- ❖ USD not verified properly

