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Former Titan 1-A Missile Facility

Restoration Advisory Board Meeting #2

Formerly Used Defense Sites (FUDS) Project

FUDS Project #J09CA1108-01

July 18, 2024

Presentation Overview

- Field Work Completed to Date
- Field Sampling Results
- 2024/2025 Work Activities
- Communications
- Q&A

Field Work Completed May 2024

- Conducted a Biological Nesting Survey & Monitoring
- Conducted Utility Clearance
- Installed 5 Groundwater Monitoring Wells
- Installed 10 Soil Gas Probes
- Surveyed New Locations
- Conducted Semi-Annual Sampling

2024 Soil Vapor Results for TCE

Legend

- Soil Vapor Probe. Trichloroethene concentration shown below soil vapor probe in µg/m^3. Results greater than the vapor intrusion screening level of 16 µg/m^3 are shown in yellow.
- TCE Isoconcentration line (µg/m^3), dashed where inferred
- Parcel Boundary
- Ephemeral/Seasonal Streams and Surface Water Bodies
- Ephemeral stream
- Former Titan 1-A Missile Facility / FUDS Boundary

2024 Soil Vapor Results for Benzene

Legend

- Soil Vapor Probe. Benzene concentration shown below soil vapor probe in µg/m³. Results greater than the intrusion screening level of 12 µg/m³ are shown in yellow.
- Benzene isoconcentration (µg/³), dashed where inferred
- Parcel Boundary
- Ephemeral/Seasonal Streams and Surface Water Bodies
- Ephemeral stream
- Former Titan 1-A Missile Facility / FUDS Boundary

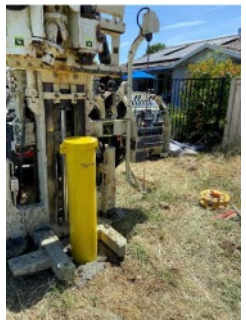
2024 Groundwater Results for TCE

Legend

- Extraction well
- Monitoring Well
  (Trichloroethene (TCE) and cis-1,2-dichloroethene (DCE) concentrations shown below the extraction/monitoring well in (µg/L). Result greater than the California maximum contaminant level for TCE of 5 µg/L and DCE of 6.0 µg/L are shown in yellow.
- Direction of Groundwater Flow
- TCE Isoconcentration (in GW, µg/L), Dashed where Estimated
- Parcel Boundary
- Ephemeral/Seasonal Streams and Surface Water Bodies
- Ephemeral stream

Work Planned for 2024/2025

- Prepare and Finalize First Semi-Annual Sampling Report
- Conduct Second Semi-Annual Sampling Event
- Prepare and Finalize Second Semi-Annual Sampling Report
- Finalize Remedial Investigation Report
- Finalize Treatability Study Work Plan and conduct treatability study
- Finalize Feasibility Study
- Prepare Proposed Plan & Decision Document
- Solicit Contractor Bids for Remedial Action



Communications

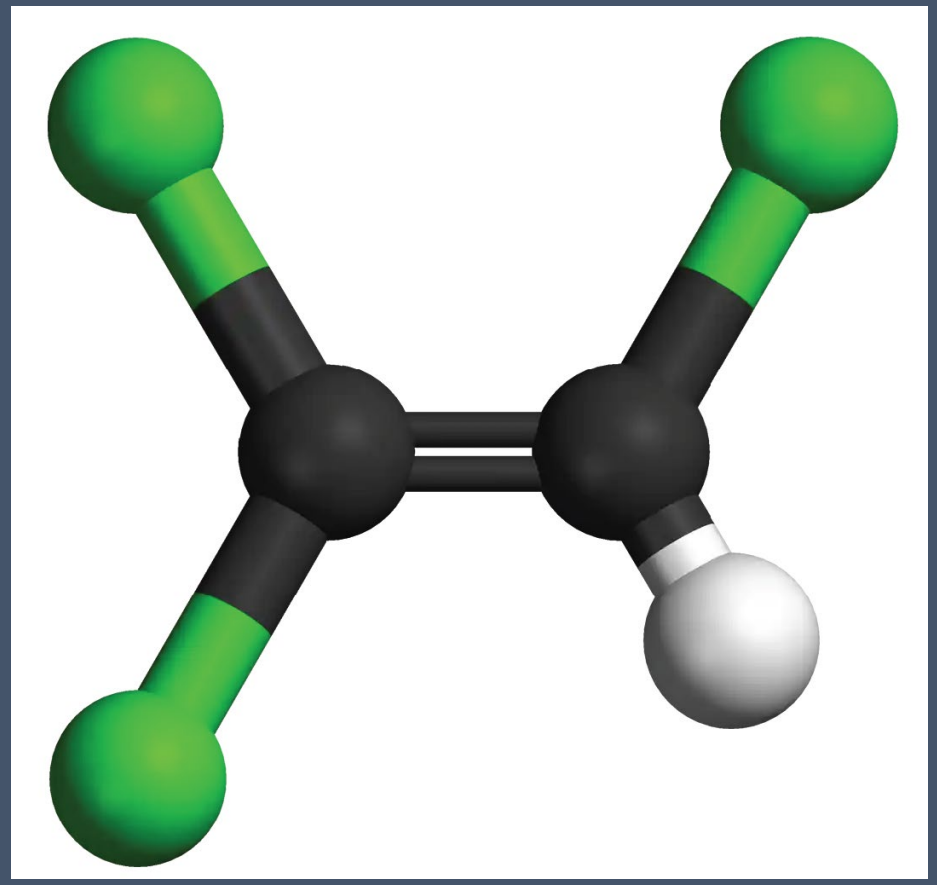
Scan the QR code above to visit the project webpage

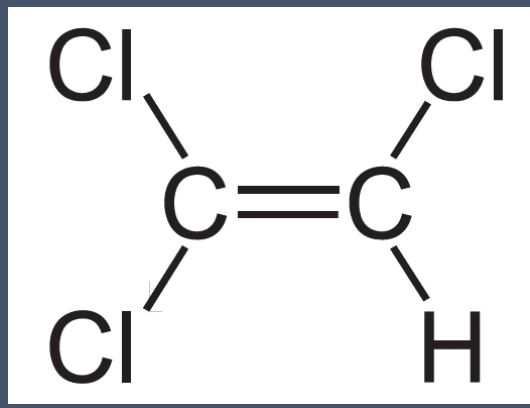
Scan the QR code above to visit the GeoTracker webpage

- **Quarterly RAB Meetings**
  - RAB to review documents/provide input and act as a conduit of communications to the community
  - Presentations and RAB minutes will be posted on the website
- **Project Webpage:** www.Titan1ACleanup.com
- **GeoTracker Webpage:** https://geotracker.waterboards.ca.gov/profile_report?global_id=T0606189198

Titan 1A RAB Meeting

- **Trichloroethene (TCE) and Vapor Intrusion: An Overview**
- 18 July 2024





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DISCUSSION TOPICS

- Human Health Risk Assessment: The Basics
- Vapor Intrusion (VI)
  - What is VI
  - VI assessment
- Trichloroethene (TCE)
  - What is TCE
  - How might one be exposed to TCE
  - How can TCE affect one's health

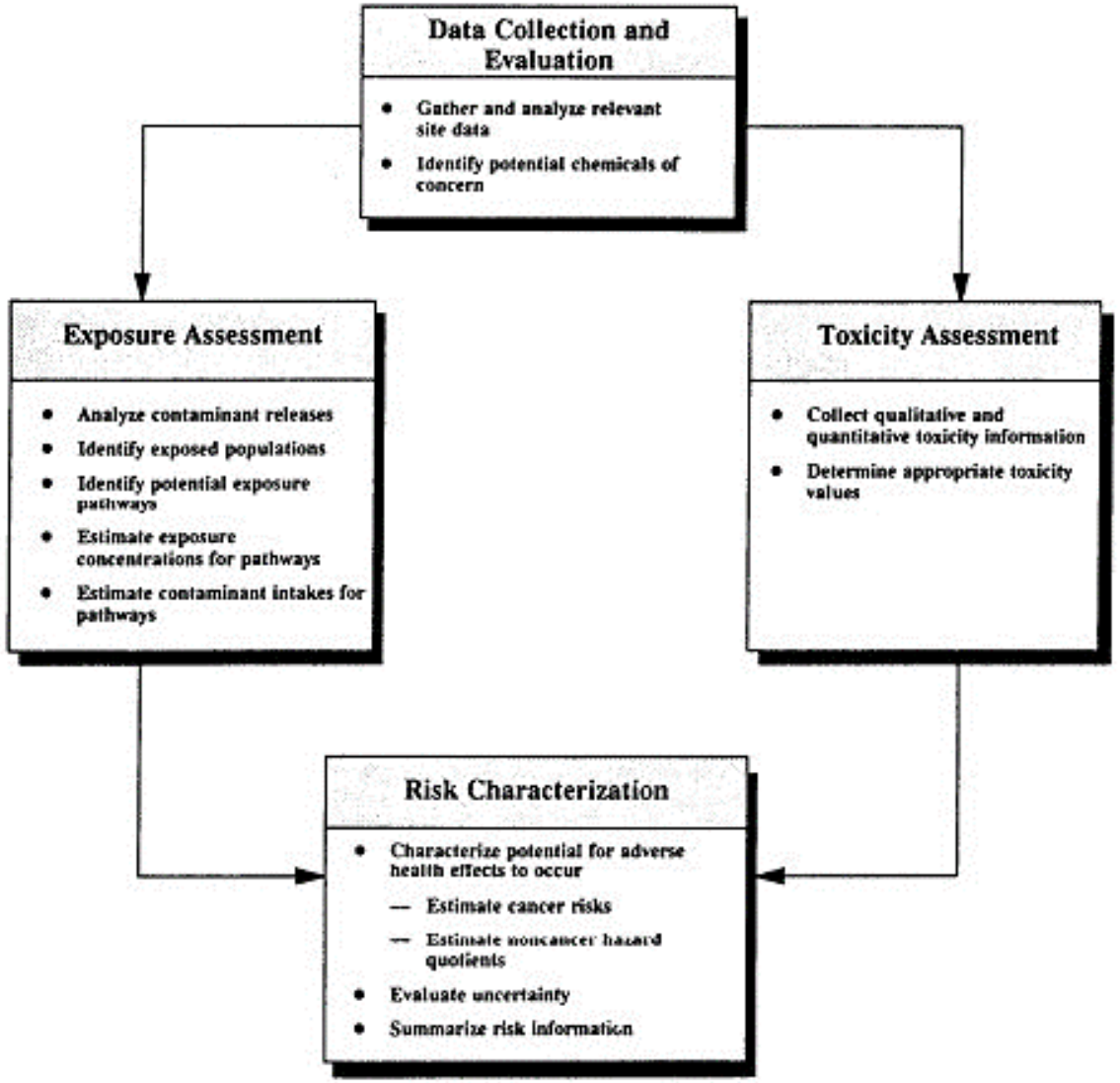
Human Health Risk Assessment: The Basics

PURPOSE

Systematically organize and evaluate data, information, assumptions, and uncertainties to help understand and predict the relationships between chemical stressors and health effects in a way that is useful for decision-making (USEPA 1998)

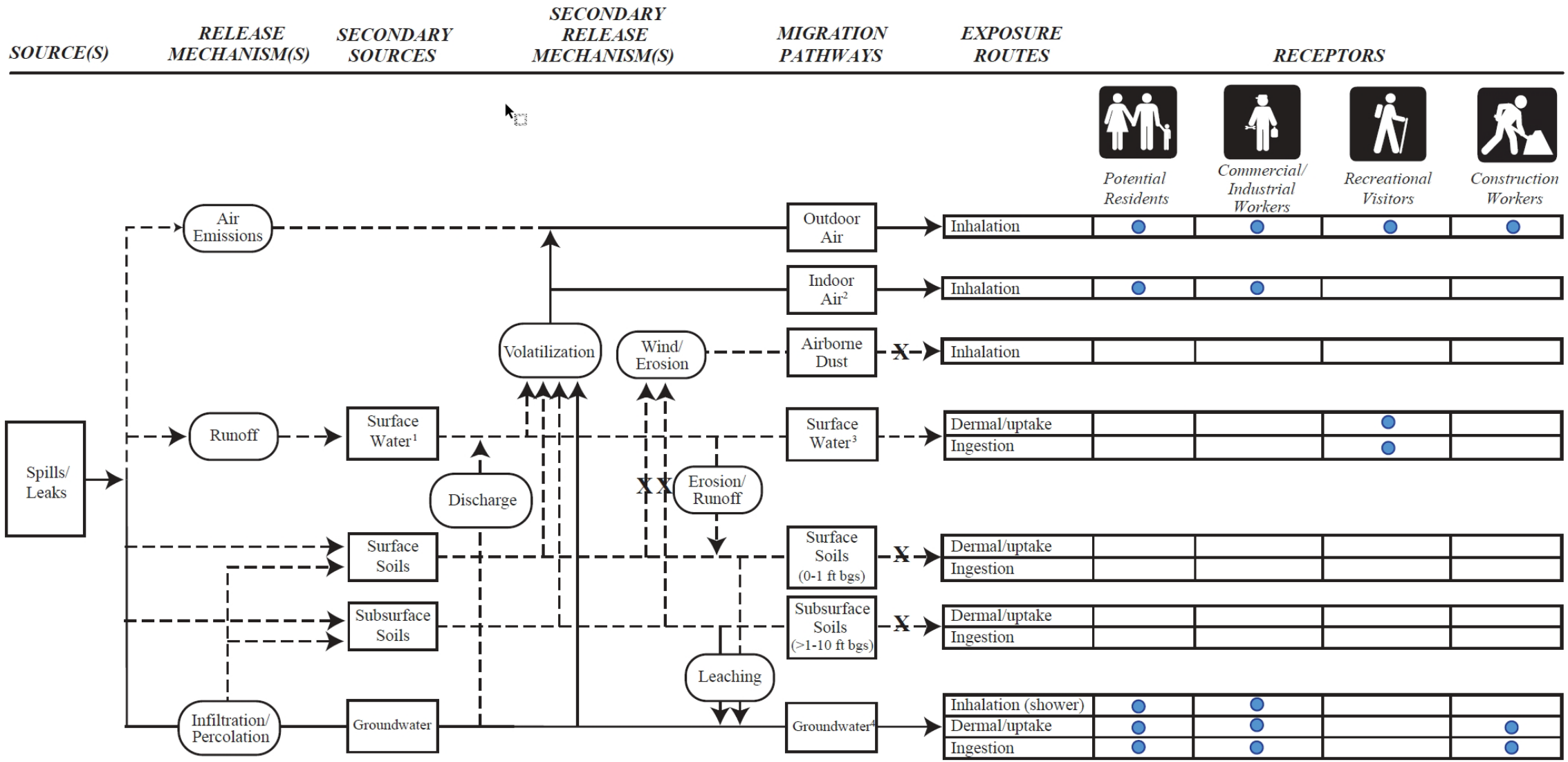
ELEMENTS OF A HHRA

- Data Collection and Evaluation
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization



Source: USEPA

CONCEPTUAL SITE EXPOSURE MODEL



● = Potentially complete exposure route (quantitatively evaluated, where applicable)

Vapor Intrusion (VI)

WHAT IS VAPOR INTRUSION?

- One of many potential ways that a person may come into contact while performing everyday indoor activities
- Migration of chemical vapors from any underground source into overlying buildings

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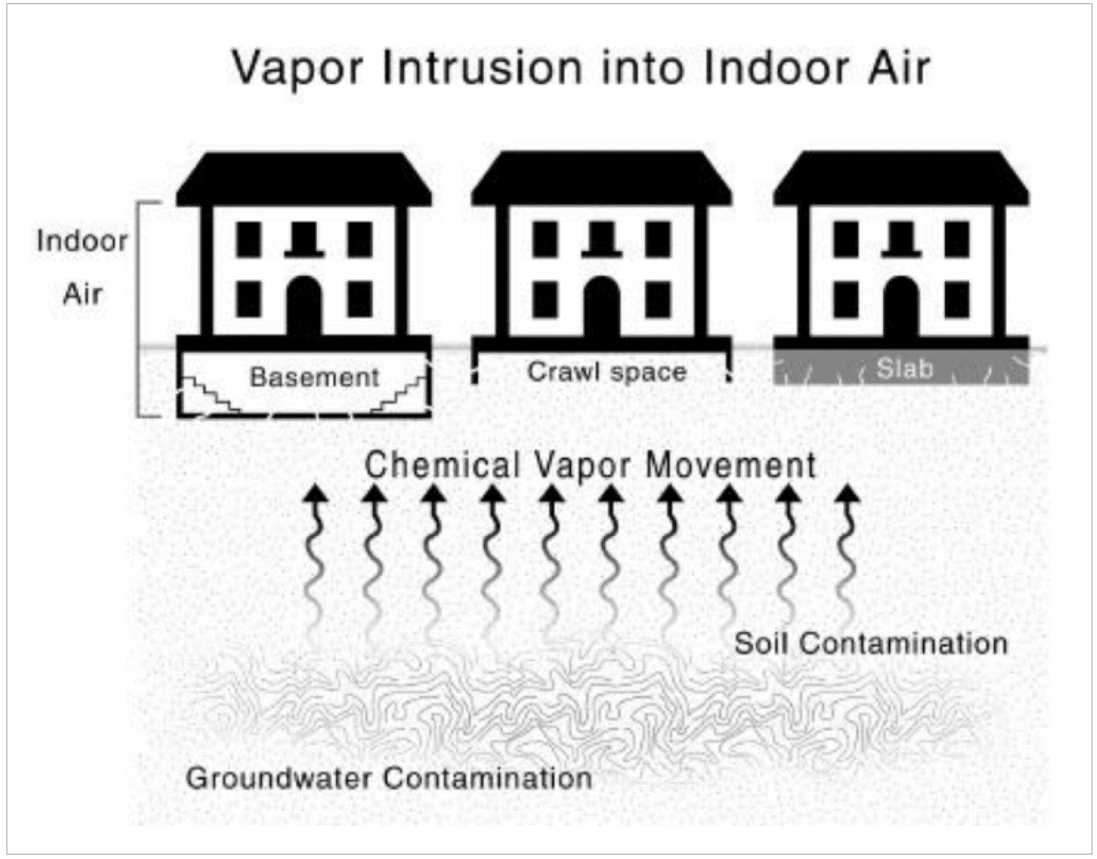
- Vapor concentrations in buildings may pose a risk to human health



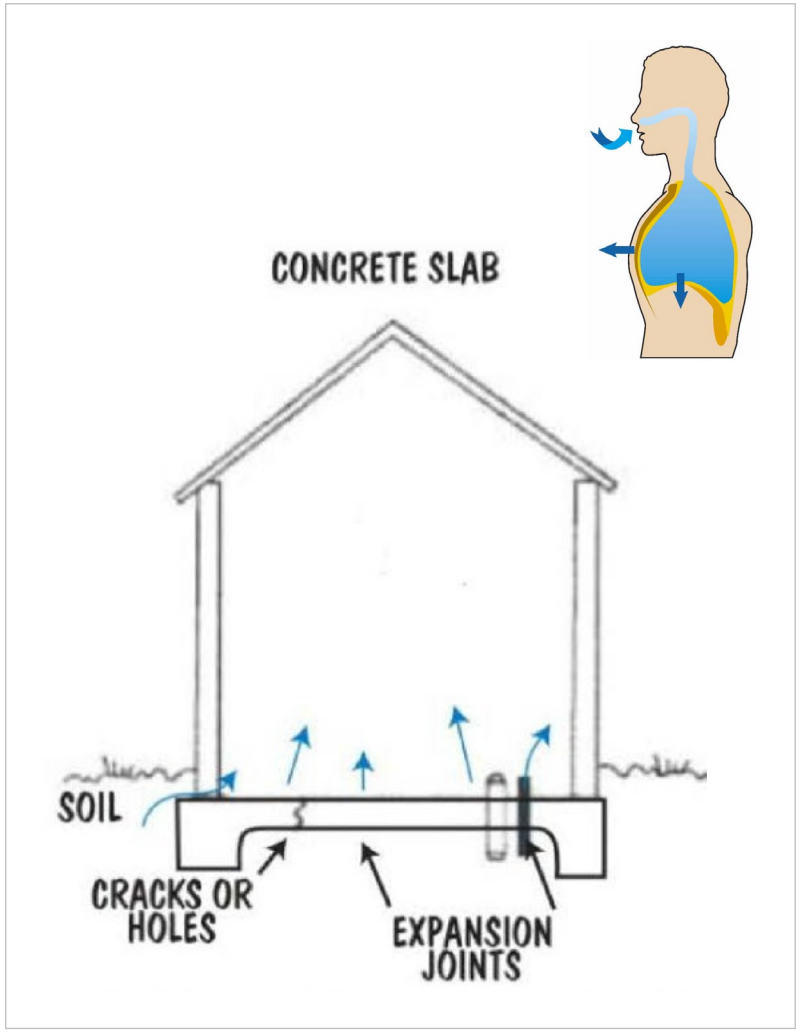
Source: USEPA (2015)

VAPOR INTRUSION EXPOSURE PATHWAY

Complete exposure pathway:

1. Subsurface vapor source is present
2. Vapors have a route to migrate into building
3. Building is susceptible to vapor entry
4. Building is occupied

A complete exposure pathway warrants further analysis



VAPOR INTRUSION ASSESSMENT

USEPA VI Guidance

Preliminary Analysis

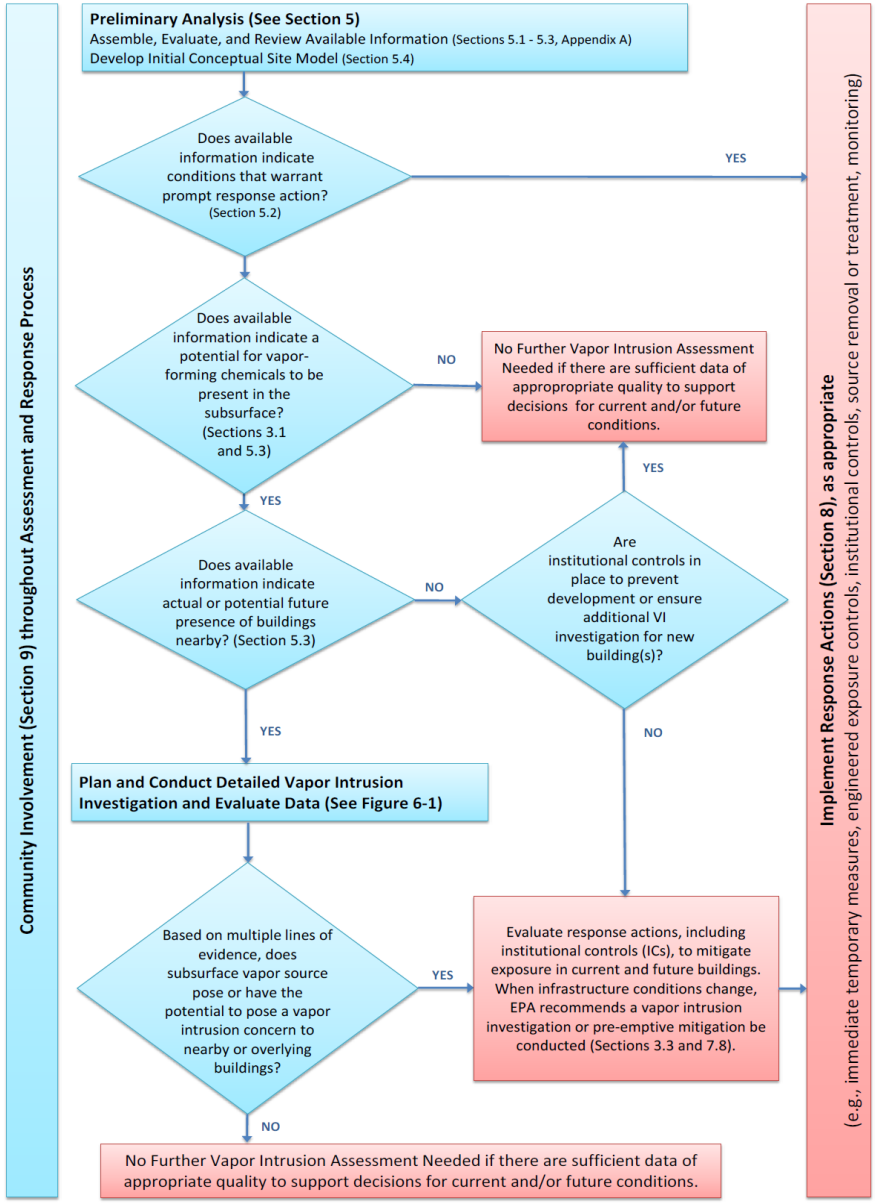
- Assemble, evaluate, and review available information
- Respond to conditions that warrant prompt action
- Identify structures and vapor-forming chemicals
- Develop initial conceptual site model (CSM)
- VISLs and preliminary risk-based screening

Detailed Analysis

- Identify vapor intrusion scenarios
- Characterize the vapor intrusion pathways / Update CSM
- Scope sampling
- Modeling and risk-based screening

Department of Defense Policy

- Vapor intrusion evaluated for overlying existing or 'nearby' structures only

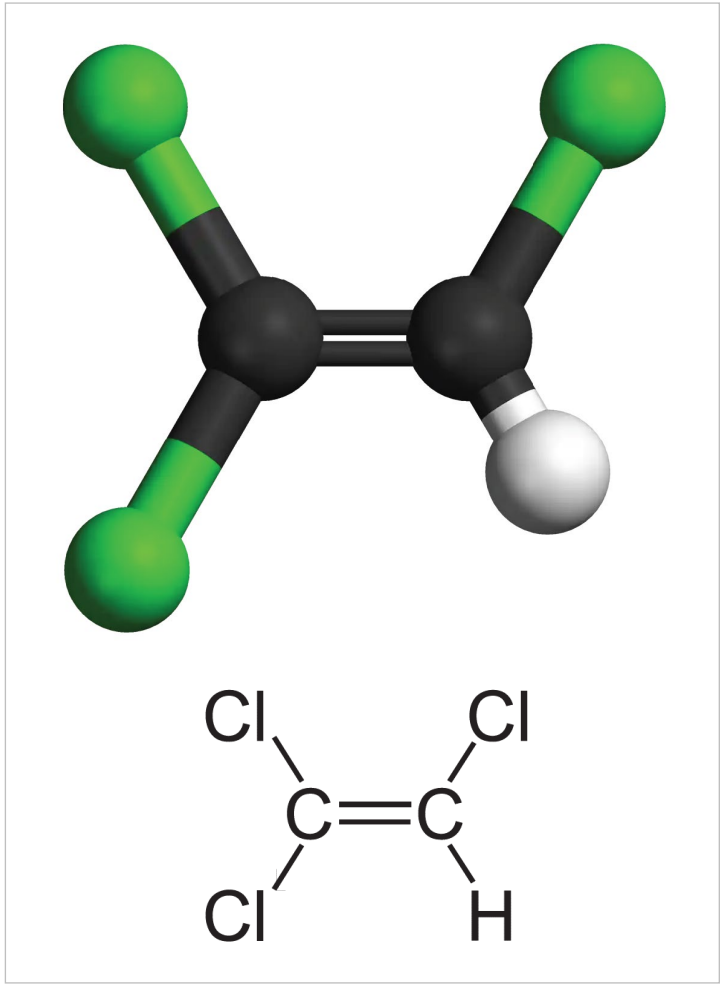


Trichloroethene (TCE)

WHAT IS TCE?

- Nonflammable, colorless liquid at room temperature
- Used as a solvent to remove grease from metal parts

- Evaporates easily but can persist in soil and in groundwater
- Once in the air, its half-life is less than one week



HOW MIGHT ONE BE EXPOSED TO TCE?

Primary routes of exposure are:

- Drinking water
- Inhaling vapor
- Contact with skin, but significantly less than inhalation or ingestion

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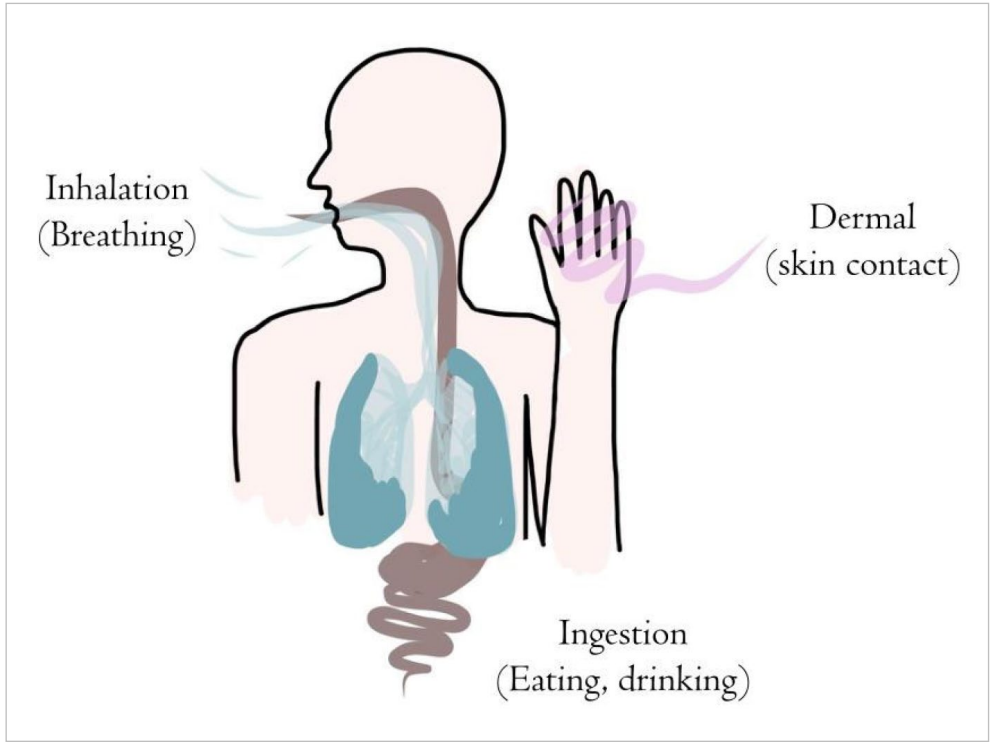
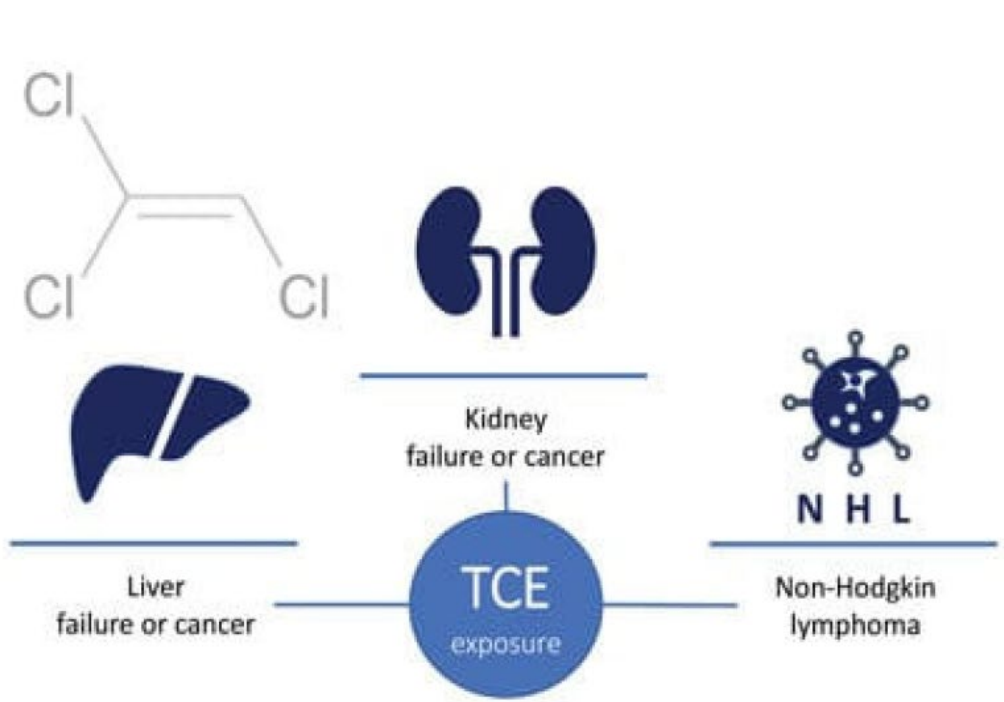
- Breath out much of the TCE in one's bloodstream
- Some TCE can be stored in body fat and may build up if exposure continues



Source: *Oregon State University web*

HOW CAN TCE AFFECT ONE'S HEALTH?

- Once used as an anesthetic for surgery
- Brief exposure
  - headaches
  - dizziness
  - skin rashes
- Long-term exposure
  - liver damage
  - kidney damage
  - developmental defects
- Carcinogenic to humans (IARC)



Source: Fuschberg.com web

Questions and (Hopefully) Answers