

Conceptual Site Model

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NEWMOA

- Interstate organization of state environmental agency directors
 - Waste site cleanup, solid waste, hazardous waste, pollution prevention, and underground storage tank programs
- 8 member States
 - CT, ME, MA, NH, NJ, NY, RI and VT
- Assists in research, information sharing, training and education
- Recognized by EPA

Multi-state priority

- All states share common desire to improve site characterization
- Similar issues for each state
- CT & MA slightly different
 - Privatized programs – LEPs & LSPs
 - Audit of reports after work
- Many professionals working in more than one state

Why are we here?

- What regulators see during site investigations:
 - Complex sites being oversimplified
 - Data force-fit or labeled as suspect
 - Data sets that lead to different conclusions
 - Assessments on source property only
 - Poor sample locations/analyses

Why, continued...

- What regulators see in reports:
 - Event chronology, raw data & a conclusion
 - CoCs dropped from study without technical justification
 - Decisions based on the “best” data set
 - Averaging in data from “clean” areas
 - Closure based on one GW sample round

What's missing from some Reports?

- A stated purpose or goal to match the conclusions
- Technical justification – why were some paths not taken and others were?
- Clear, concise and logical presentation of data

Time is Money

- We all face similar challenges
 - Do it faster
 - Do it for less money / resources
 - Take a little more risk
 - Over commit , under estimate
- If you come to the wrong conclusion was it a difficult site or poor work?
 - How can someone tell?

GOAL

- To improve the communication between waste site professionals and persons interested in knowing about a waste site through the development of a Conceptual Site Model

How do you review a report?

- Consider un-biased data first?
 - USGS topo and geologic maps
 - Review soil boring logs
 - Regional GW and SW maps or data
- Previous experience in the study area?
- Develop your own CSM to test the report against?

WHO's Involved?

- Responsible parties
- Consulting professionals
- Finance and insurance representatives
- State agency officials
- Local officials-BOH, fire department, police
- Abutters, residents
- Public, media

Why Use a CSM?

- All involved persons develop their own ideas of “what’s happening”
 - Assist in organizing first impressions
 - Bring forward assumptions
 - Weigh significance of data gaps
 - Focus on collection of the “best” data to support decision making

The Lead Investigator

- He or she is the single most knowledgeable person for the disposal site
- He or she needs to establish and maintain this position
- CSM can serve as a primary communication tool
- Help focus in on areas of agreement or disagreement

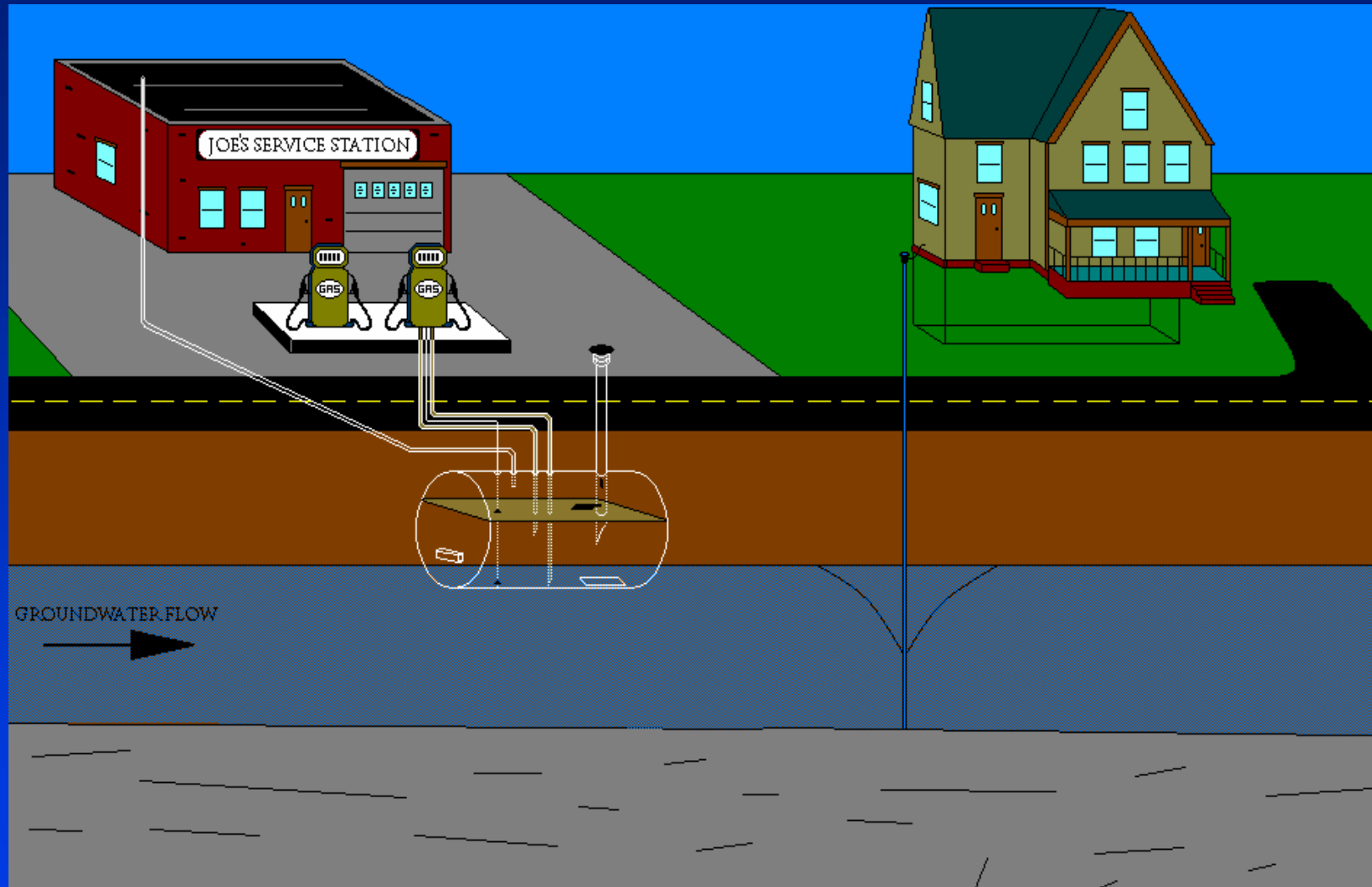
Thinking About Conceptual Site Models

- A way to organize the process of site evaluation and remedial design.
- An application of the scientific method.
- A “language” to convey thoughts and decisions and help others reach the same conclusions.
 - How do most regulatory/consultant meetings begin?

WHAT Is a CSM?

- Several Definitions
 - EPA
 - ASTM
 - NH DES
 - DOD
- 3-D “picture”
- Representation
- Summary of site conditions
- Known or suspected

Conceptual Site Model Development



“A Picture Is Worth a Thousand Words”

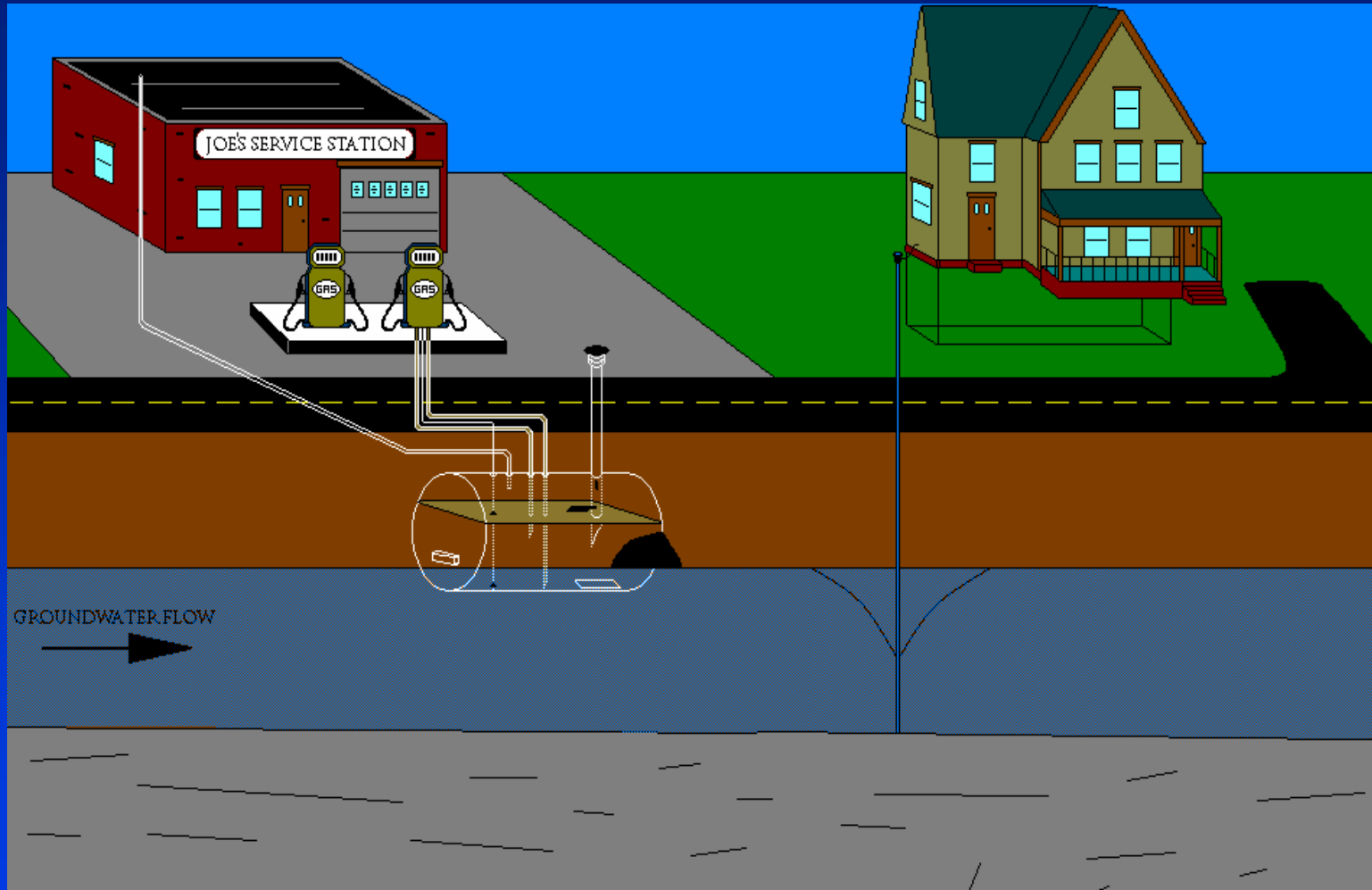
Considering that many complex
site investigation reports and
appendices contain thousands of
pages of info:

“A CSM may be worth a thousand
pages”

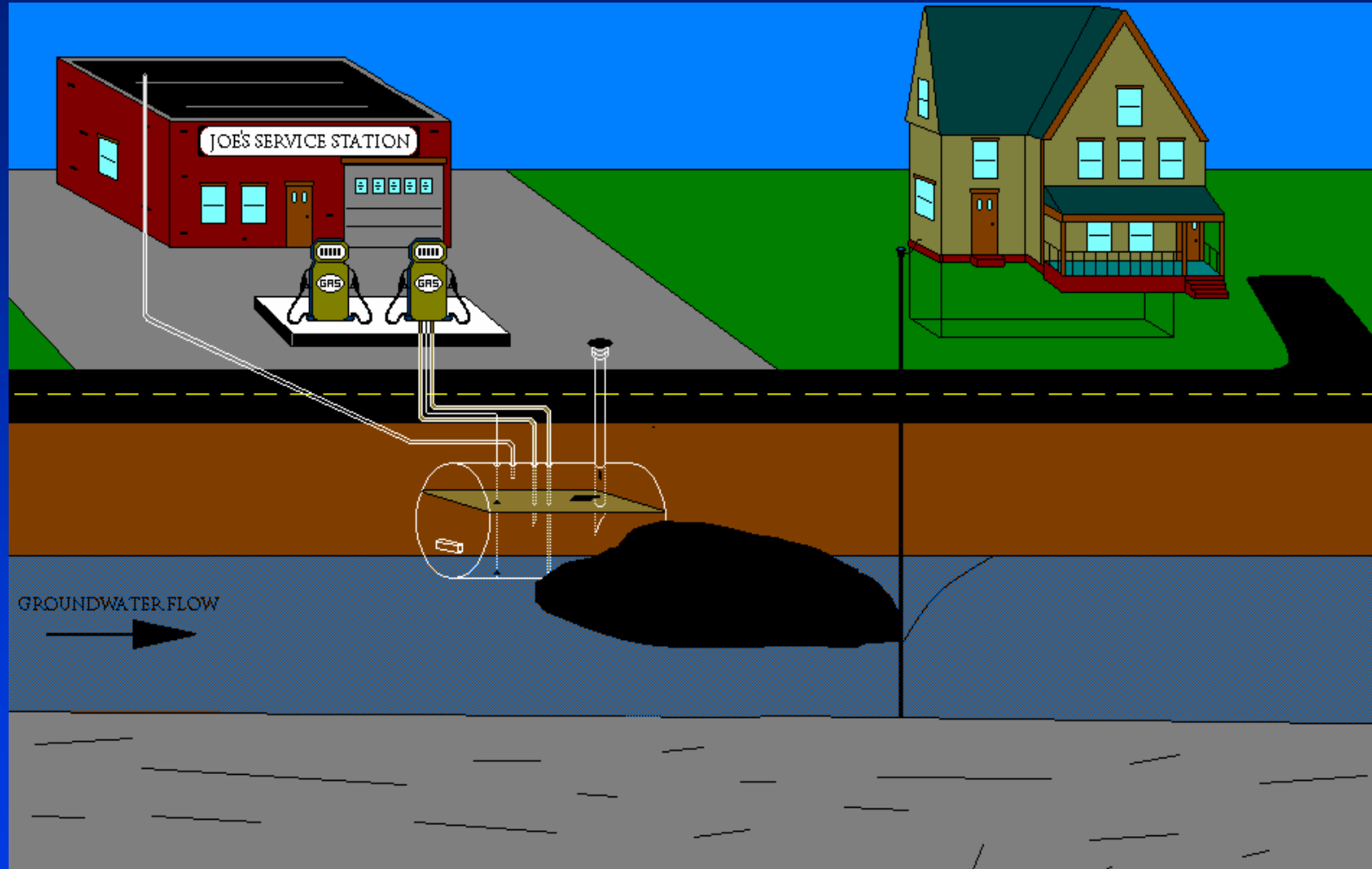
CSM - “Picture in Time” or Investigative Approach?

- It provides an organized approach to site investigation
- It includes pictorial representations of site features and information to aid in communication
- Refine/revise with new information

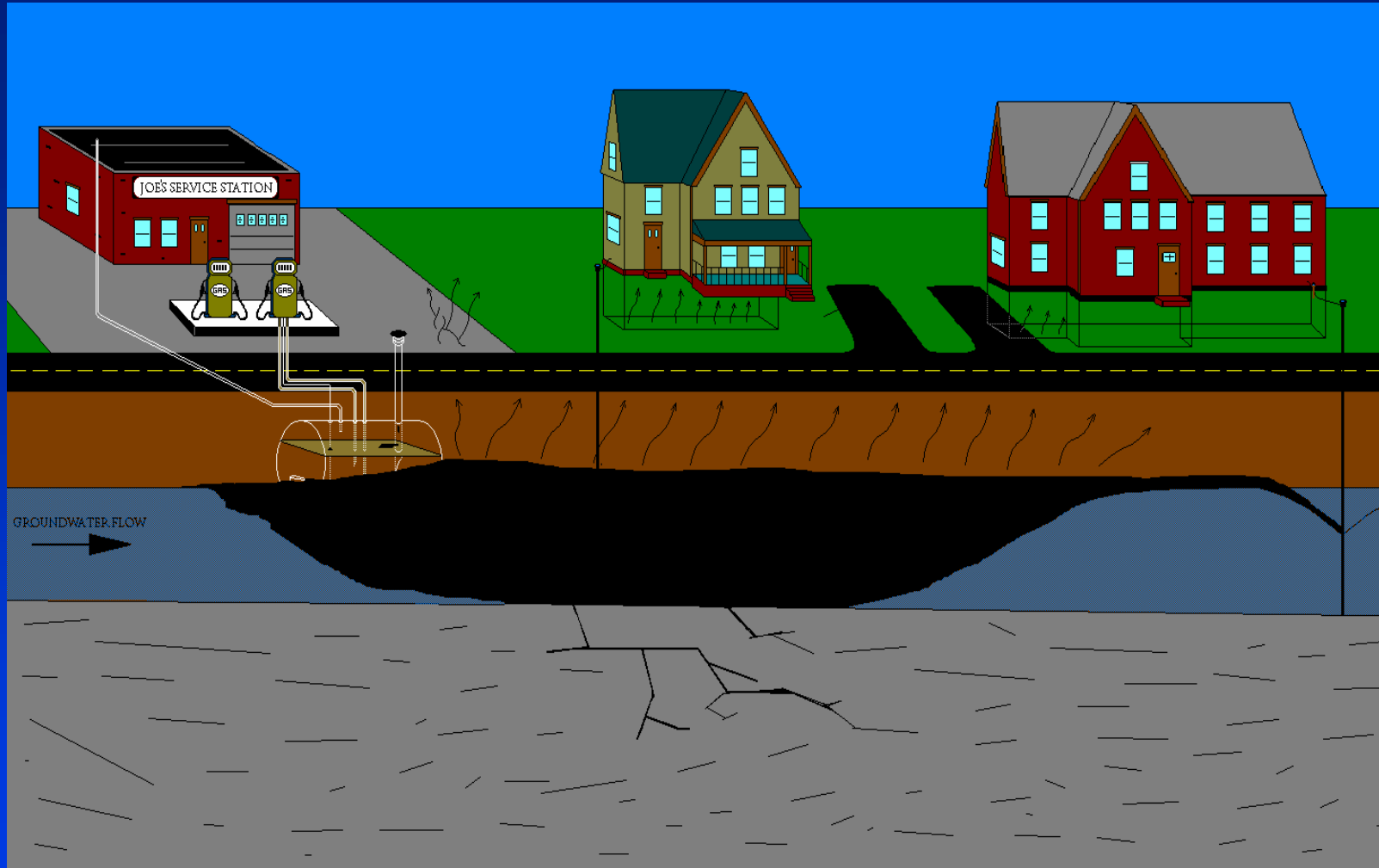
Conceptual Site Model Development



Conceptual Site Model Development



Conceptual Site Model Development



WHEN Can It Be Used?

- Prior to a property transaction
- At the time of release to support time critical field actions
- Prior to proposing any work activities
- At the time of documenting completion of work activities

The Evolving CSM

- Preliminary CSM - used to plan field mobilizations for data collection
- Evolving CSM - refined to incorporate the data during collection and evaluation
- Final CSM - results from validation process
- This process is repeated to produce versions of the CSM for many project milestones

CSM End Uses

- Exposure assessment
- Risk characterization
- Remedial action selection
- Remediation system design
- Performance monitoring design
- Site closure documentation

Conceptual Site Model

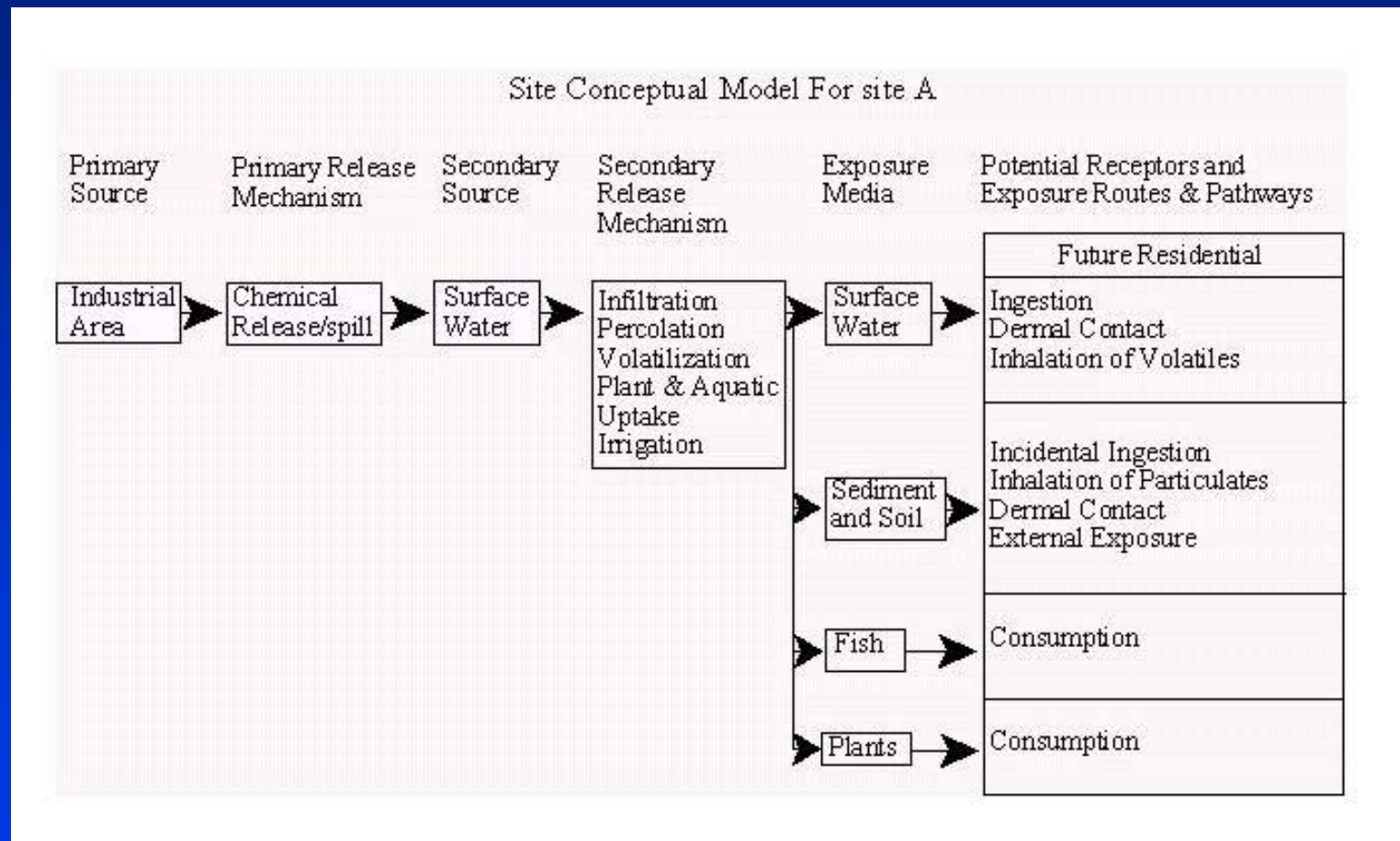
- Primary information set for decisions
- Supports response action outcomes
- Technical basis for professional opinions

CSM Table

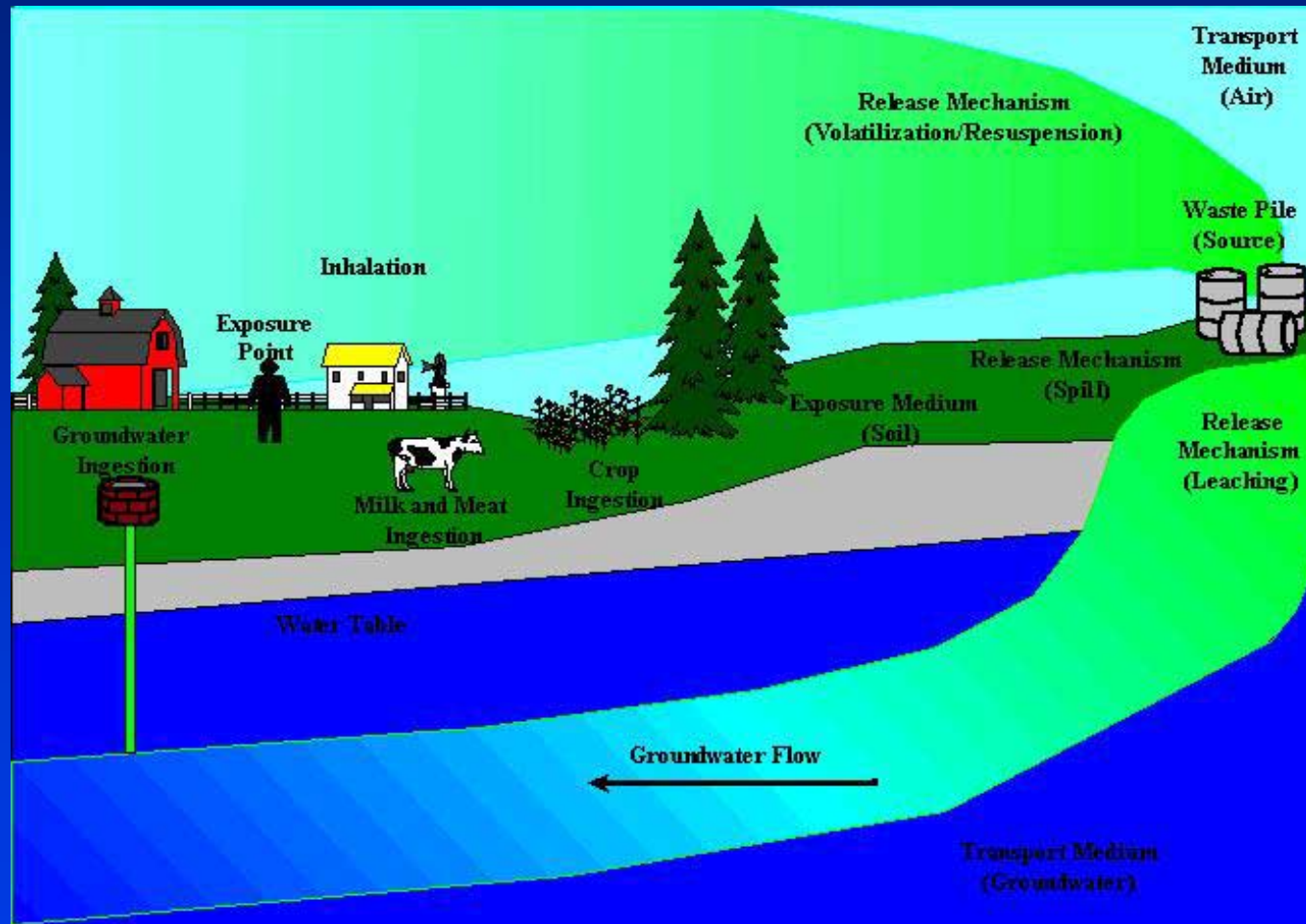
Table Style Conceptual Site Model for Site A

Source	Environmental Exposure Medium	Exposure Point	Exposure Route	Exposed Population
Industrial Area	Groundwater	Residences' Tap Water	Ingestion, Dermal Contact, and Inhalation of Volatiles	Site A Residents
Industrial Area	Sediment and Soil	Residences' Yards and Stream	Incidental Ingestion, Inhalation of Particulates, Dermal Contact, and External Exposure to Radionuclides	Site A Residents
Industrial Area	Surface Water	Residences' Gardens	Consumption of Plants	Site A Residents
Industrial Area	Fish	Stream	Consumption of Fish	Site A Residents

Stem and Leaf Diagram



Pictorial CSM



Significance of Data Gaps

- Significant data gaps must be filled through additional investigations.
- Rationale for not investigating further must be explained.
- Significant judgment calls are worthy of technical discussion!
- Technical justification and documentation for decisions must be provided !!!