

# Agenda

- 6:30 – 6:40 Introductions and Overview
- 6:40 – 6:45 Representative Anderson
- 6:45 – 7:25 Presentations
  - Northrop Grumman
  - Fantastic Caverns
  - MDNR
  - MDHSS
- 7:25 – 8:00 Question and Answer Open Forum
- 8:00 – 8:30 Availability Session



**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

# Litton Systems Inc. Site

4811 West Kearney Street



# What is Trichloroethylene (TCE)

- Man-made chemical, colorless liquid
- Used as a cleaner and degreaser
- Evaporates easily into the air (volatile organic compound changes from a liquid to a vapor)

## Trichloroethylene - ToxFAQs™

CAS # 79-01-6

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Trichloroethylene is used as a solvent for cleaning metal parts. Exposure to very high concentrations of trichloroethylene can cause dizziness, headaches, sleepiness, incoordination, confusion, nausea, unconsciousness, and even death. The Environmental Protection Agency (EPA) and the International Agency for Research on Cancer (IARC) classify trichloroethylene as a human carcinogen. Trichloroethylene has been found in at least 1,045 of the 1,699 National Priorities List sites identified by the EPA.

### What is trichloroethylene?

Trichloroethylene is a colorless, volatile liquid. Liquid trichloroethylene evaporates quickly into the air. It is nonflammable and has a sweet odor.

The two major uses of trichloroethylene are as a solvent to remove grease from metal parts and as a chemical that is used to make other chemicals, especially the refrigerant, HFC-124a. Trichloroethylene was once used as an anesthetic for surgery.

### What happens to trichloroethylene when it enters the environment?

- Trichloroethylene can be released to air, water, and soil at places where it is produced or used.
- Trichloroethylene is broken down quickly in air.
- Trichloroethylene breaks down very slowly in soil and water and is removed mostly through evaporation to air.
- It is expected to remain in groundwater for long time since it is not able to evaporate.
- Trichloroethylene does not build up significantly in plants or animals.

### How might I be exposed to trichloroethylene?

- Breathing trichloroethylene in contaminated air.
- Drinking contaminated water.
- Workers at facilities using this substance for metal degreasing are exposed to higher levels of trichloroethylene.
- If you live near such a facility or near a hazardous waste site containing trichloroethylene, you may also have higher exposure to this substance.

### How can trichloroethylene affect my health?

Exposure to moderate amounts of trichloroethylene may cause headaches, dizziness, and sleepiness; large amounts may cause coma and even death. Eating or breathing high levels of trichloroethylene may damage some of the nerves in the face. Exposure to high levels can also result in changes in the rhythm of the heartbeat, liver damage, and evidence of kidney damage. Skin contact with concentrated solutions of trichloroethylene can cause skin rashes.

There is some evidence exposure to trichloroethylene in the work place may cause scleroderma (a systemic autoimmune disease) in some people. Some men occupationally-exposed to trichloroethylene and other chemicals showed decreases in sex drive, sperm quality, and reproductive hormone levels.

### How likely is trichloroethylene to cause cancer?

There is strong evidence that trichloroethylene can cause kidney cancer in people and some evidence for trichloroethylene-induced liver cancer and malignant lymphoma. Lifetime exposure to trichloroethylene resulted in increased liver cancer in mice and increased kidney cancer and testicular cancer in rats.

The IARC and the EPA determined that there is convincing evidence that trichloroethylene exposure can cause kidney cancer. The National Toxicology Program (NTP) is recommending a change in cancer classification to "known human carcinogen" [http://ntp.niehs.nih.gov/info/mono/ntp/tnltxc\\_508.pdf](http://ntp.niehs.nih.gov/info/mono/ntp/tnltxc_508.pdf).

# MoDNR Superfund Role

- Investigate releases of hazardous substances
- Oversee cleanup work
- Respond to exposure risk
- Enter legal orders with responsible parties

# Litton Systems Inc. Site

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Valerie Wilder

Superfund Section Chief

Environmental Remediation Program

# Presentation Topics

- Investigation History
- Public and Private Well Sampling
- MoDNR Fantastic Caverns Investigation
- Conceptual Site Model
- Electro-Pac Site Investigation
- Future Communication

# Investigation History

- September 1979
  - Plating waste observed overflowing from A/B Lagoon into on-site sinkhole
- September 1980
  - Litton ordered to connect to Springfield's sewer system
  - EPA Superfund investigation
- 1981 - 14 drinking water wells sampled
  - 1 TCE detection < 5 ppb (MCL)

# Investigation History

- April 1985
  - MoDNR Preliminary Assessment
- 1980-1988
  - EPA and Department Groundwater Investigations
- 1994-2001
  - Litton Phase I and II Investigations
- 2001-Present
  - Northrop Grumman Investigations

# MoDNR Site Reassessment 2003-2006

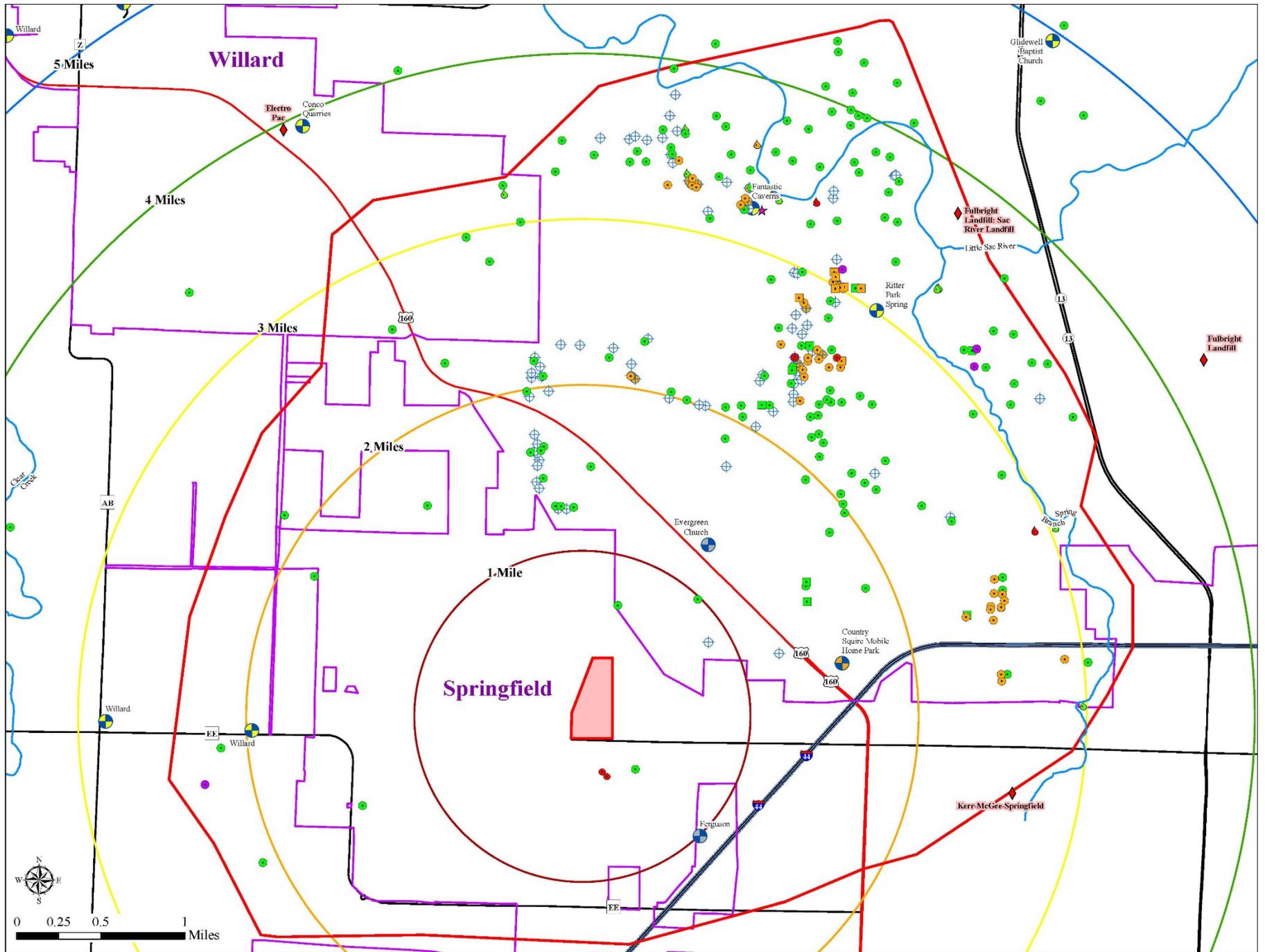
- Private and public drinking water sampling
  - 74 private wells
    - 1 well > 5 ppb
    - 12 wells < 5 ppb
  - 6 public wells – no TCE detected
- Spring sampling
  - TCE and copper near Fantastic Caverns
- Fantastic Caverns air sampling
  - TCE detected in air

# Private Well Sampling 2018-2019

- Established a focus area
  - Dye trace studies
  - Previous TCE detections
- Five sampling events from November 2018 to January 2019
- 191 total private wells sampled
- 13 wells outside of the focus area

# Private Well Sampling 2018-2019

- 4 wells with TCE > 5 ppb
  - Carbon filtration systems installed
- 39 wells with TCE < 5 ppb
- 148 wells non-detect
  - Including 13 outlier wells



# Future Private Well Sampling 2019

- Regular monitoring of all TCE detections
- Expand focus area to the south
  - Wells inside city limits
- Additional sampling inside focus area
  - Priority for wells near TCE detections
- Next event: April 2019

# Public Drinking Water Results

- Springfield and Willard – No TCE
- Country Squire Village
  - Intermittent low level TCE
  - Below MCL
  - Quarterly monitoring to continue

<https://www.dnr.mo.gov/DWW/>

# Fantastic Caverns

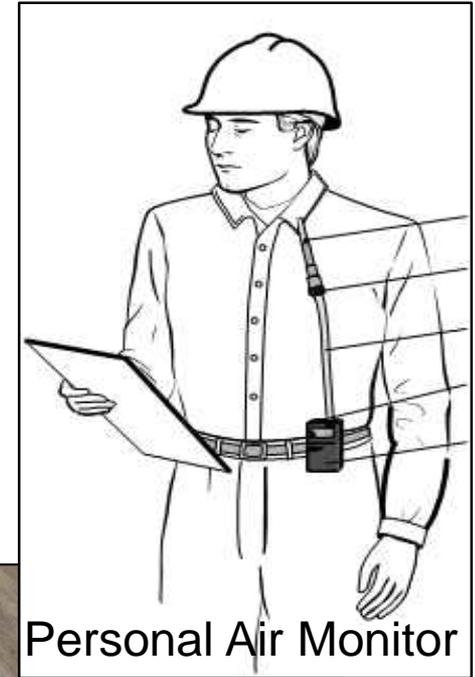
## MoDNR Superfund Investigations

- Air sampling in 2004-2005
- Additional assessment initiated 2016
- Cave air sampled at 9 locations along tour route monthly in 2017
- TCE detected during most events
- Stationary samples below worker action levels except during 3 events

# Fantastic Caverns

## MoDNR Superfund Investigation

- Stationary vs. personal air monitoring (PAM)
- PAMs collected during 6 of the events
- TCE not detected in the PAMS above worker action level in 2017



# Fantastic Caverns

## MoDNR Superfund Investigations

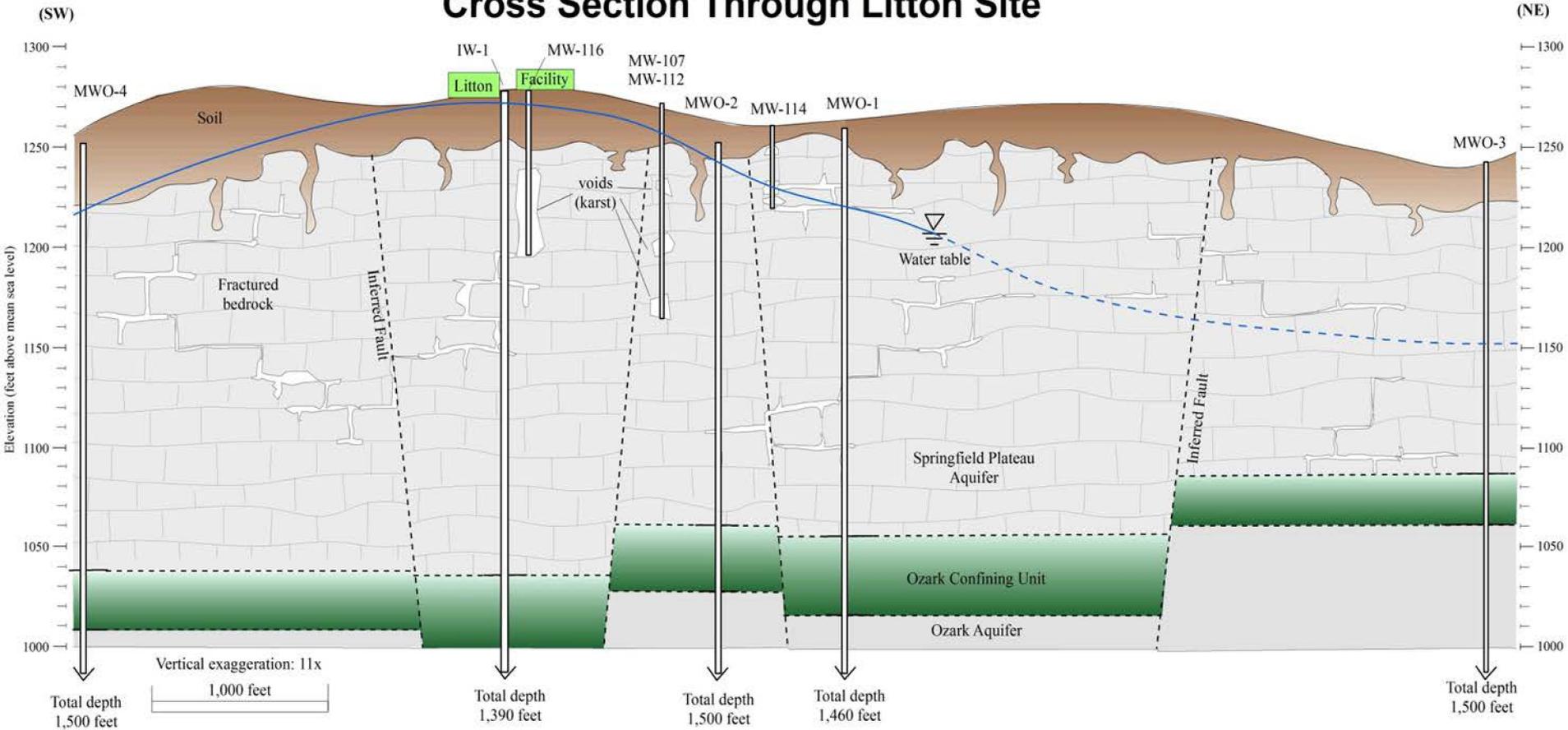
- Lower passage samples
  - Highest TCE levels in air
  - Groundwater present
- Visitor Center sampling
  - 10 stationary samples in 2017
  - 7 non-detect TCE
  - 3 TCE detections below residential action level

# Exposure Concerns

- Drinking water
- Air inside my home
  - Vapor Intrusion

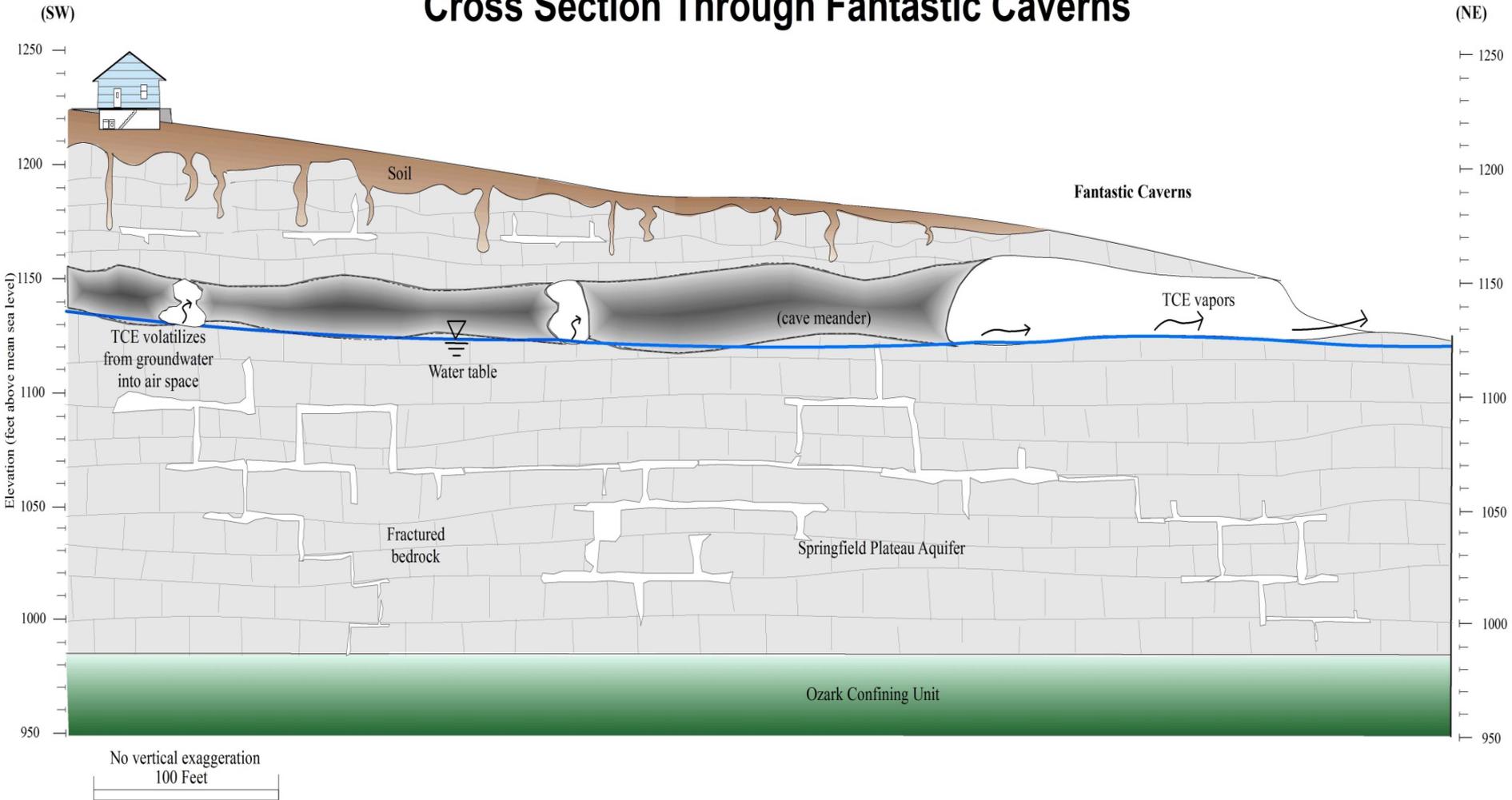


## Cross Section Through Litton Site





## Cross Section Through Fantastic Caverns



# Electro-Pac - Willard

- Electroplating facility operated 1972-1974
- TCE wastewater discharged to unlined lagoon
- Limited soil cleanup in 1975
- Limited investigations in 1988 and 1990
- Scope of reassessment sampling:
  - Nearby private wells
  - Soil and soil gas
  - Springs



# Future Communication

- Files Open to Public
- Seek Public Input
- Web Site Updates with Fact Sheets
- Communications Plan
- Comment Forms
- Update Public Meeting in September