

# Billings PCE Superfund Site

November 1, 2023

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EPA Remedial Project Manager



# Meeting Agenda

Introduce Site Team

Provide Site Overview

Discuss Site Investigations and Next Steps

Meeting is structured to allow for questions or provide comments



## Site Team





# Questions/Comments



# Site Overview



## **Background**

**900 + acre chlorinated solvent plume in shallow groundwater, extending approximately three miles under a mixed-use area toward downtown Billings**

- 5 separate releases have been identified**
- Releases from historic dry-cleaning businesses, mainly tetrachloroethylene (PCE), and break-down products including trichloroethylene (TCE) and vinyl chloride.**
- These chemicals are commonly called Chlorinated Solvents or Volatile Organic Compounds**
- Primary concern is accumulation of contaminants in indoor air commonly called vapor intrusion**

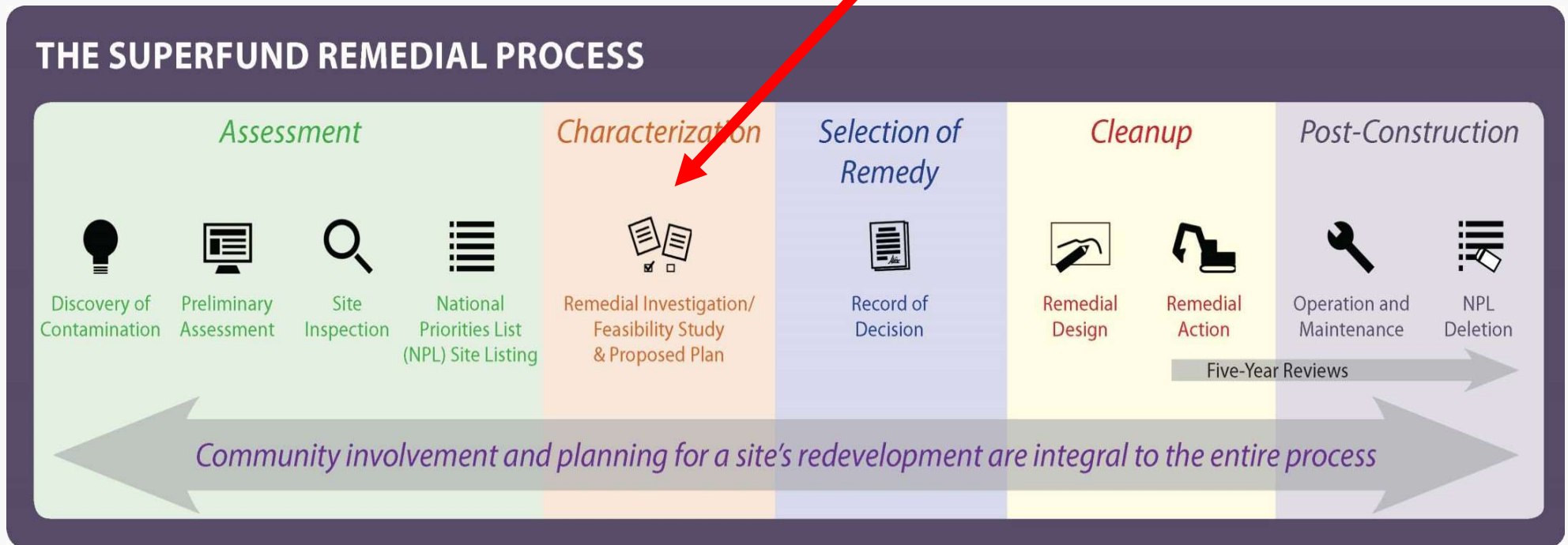


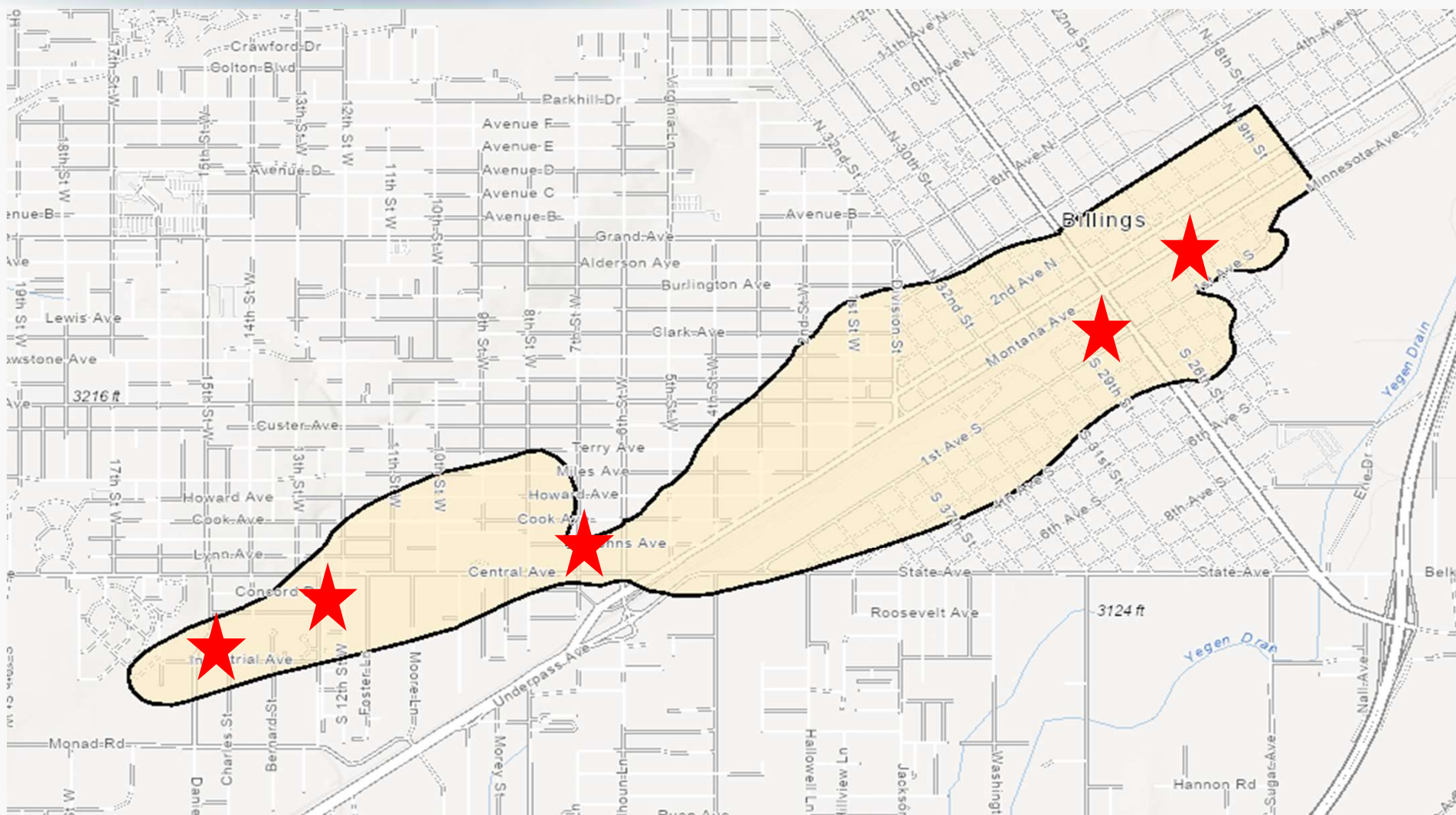
## Study Area

- 3200 structures above groundwater plume
  - ~ 1200 have basements
  - ~ 2000 are residential structures
    - High rental occupancy
    - Many are duplexes or multi-purpose commercial/residential
  - **Several hundred are identified as high priority based on groundwater concentrations above 50 parts per billion**
  - Multi-story buildings downtown
  - Multiple irrigation wells in study area but no known drinking water use



# Study Area vs Site Boundaries







## Site is Broken into 3 Operable Units

- OU1 – addresses the indoor air pathway
  - Vapor Intrusion
  - Record of Decision expected by September 2024
  - Considered an interim action (not addressing cleanup
    - rather mitigating the indoor air exposure pathway)



# What is Vapor Intrusion?

- **Vapor intrusion is a way that chlorinated solvents in soil and groundwater can enter and accumulate inside buildings**
- **A complete vapor intrusion (VI) exposure pathway consists of the following five elements (from EPA guidance, 2015):**
  - 1. Vapor-forming chemicals are present in subsurface source(s) under buildings**
  - 2. Vapors have a route along which to migrate toward the building**
  - 3. The structures are susceptible to soil gas entry**
  - 4. At least one vapor-forming chemical found in the subsurface vapor source is (or is anticipated to be) present in the indoor air**
  - 5. The building is or may be occupied by one or more individuals when the vapor-forming chemical is (or is anticipated to be) present**



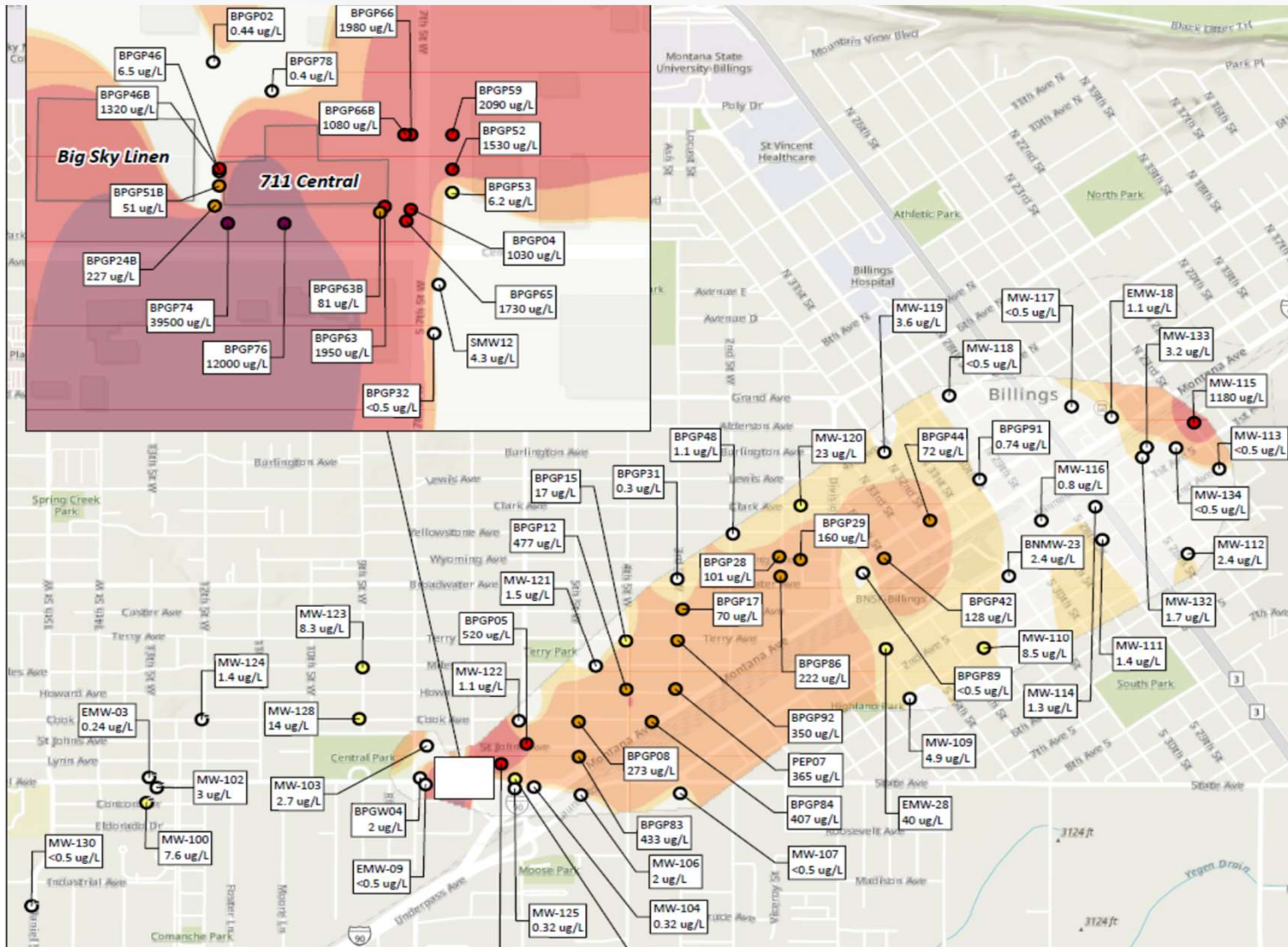
# Health Concerns

- **Vapor Intrusion**
  - **At high concentrations, a person breathing indoor air could experience immediate symptoms such as nausea and dizziness after short-term exposures**
  - **Long-term exposures to lower concentrations may be associated with adverse effects including neurological conditions, liver or kidney effects, and certain cancers**



# OU1 Investigations

- **Over 300 structures investigation in 2022 and 2023**
  - **Indoor air, subslab, crawl space samples collected**
  - **Approximately 110 residential and 50 commercial properties were sampled**
- **Over 100 soil gas samples**
  - **Delineate the soil gas plume**
- **Approximately 80 sewer gas samples were collected**
  - **Historically released spent dry cleaning fluids down floor drains**



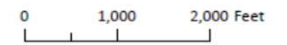
**Figure 3**  
**Billings PCE Site**  
**Perchloroethylene Concentration**  
**2022 Analytical Results**  
**with MCL Exceedances**

- Maximum Contaminant Level (MCL) Exceedance 5 ug/L
- ≤ 5 ug/L
  - > 5 to ≤ 50 ug/L
  - > 50 to ≤ 500 ug/L
  - > 500 to ≤ 5000 ug/L
  - > 5000 ug/L

Date: March 1, 2023

Map Projection: UTM Zone 12N, WGS84, Meters

Data Sources:  
 Sample Locations: U.S. EPA & ESAT (2022);  
 Base Map: Esri World Topographic Map Web Service (2023).





# Trace Atmospheric Gas Analyzer



A minimum of 30 residents interested in indoor air sampling, can mobilize the bus to sample this winter



# Mitigation Systems

Have installed 15 mitigation systems

10 more systems will be installed in November



Further mitigation systems will get installed after Record of Decision has been issued\*\*\*

Not all structures are anticipated to get a mitigation system



# OU1 Feasibility Study

Agencies are currently reviewing the Focused Feasibility Study  
Human Health Risk Assessment is expected toward end of  
year

The **feasibility study** (FS) is the mechanism for the development, screening, and detailed evaluation of alternative cleanup options

Two alternatives are being considered



# OU1 Proposed Plan

EPA expects to issue a Proposed Plan in early Spring 2024

Proposed Plan will identify EPA's preferred remedy as well as proposed cleanup goals for mitigating indoor air pathway

Will also identify proposed site boundaries

Proposed Plan allows for public participation and there is a minimum of a 30 day comment period

EPA will issue a fact sheet announcing availability of Proposed Plan and date and time for public meeting



# Questions/Comments



# **OU2 – Source Control/Groundwater**



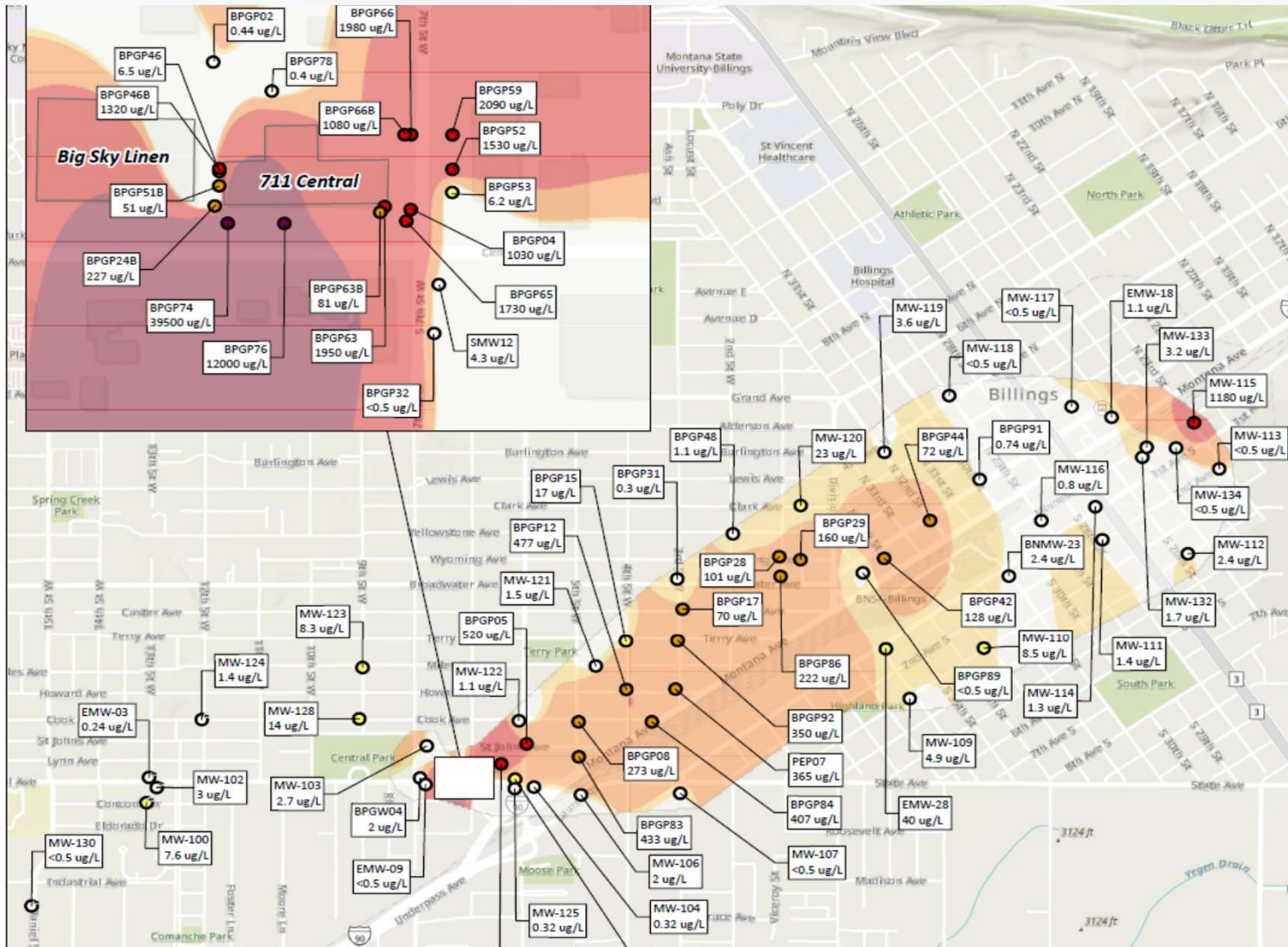
# Health Concerns

- **Soils**
  - **Utility or construction workers could be dermally exposed to contaminated soils during excavation, or to solvents and vapors intruding into utilities such as storm sewer pipes**
- **Groundwater**
  - **No known potable uses of groundwater**
  - **A person might be exposed if they drink contaminated water from irrigation wells or use irrigation water for recreational purposes**
  - **Fact sheet has additional information**



# Groundwater Investigations

- **Have collected groundwater samples from approximately 80 monitoring wells and 40 residential wells to better determine the underground locations and concentrations of contaminants during high-water and low-water seasons**
- **Have continuously collected groundwater semi-annually since Fall 2021**
- **Will be issuing a task order to an environmental contractor next year to write the OU2 Feasibility Study and support EPA in development of a Proposed Plan and Record of Decision**
  - **ROD anticipated late 2025/early 2026**

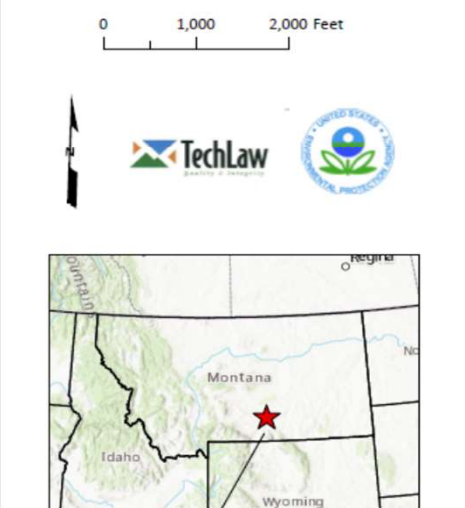


**Figure 3**  
**Billings PCE Site**  
**Perchloroethylene Concentration**  
**2022 Analytical Results**  
**with MCL Exceedances**

Maximum Contaminant Level (MCL) Exceedance  $5\ \mu\text{g/L}$

- $\leq 5\ \mu\text{g/L}$
- $> 5$  to  $\leq 50\ \mu\text{g/L}$
- $> 50$  to  $\leq 500\ \mu\text{g/L}$
- $> 500$  to  $\leq 5000\ \mu\text{g/L}$
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# EPA Involvement

- **EPA's removal program has been involved since 2007**
- **Extensive groundwater investigation and modelling**
- **Excavation and disposal of 6,600 tons of contaminated soil around 7<sup>th</sup> and Central**
  - **Sheet piling installed in areas along Central Ave**
  - **In situ chemical oxidation was implemented in four injection events to reduce contaminant concentrations**
- **Multiple structures evaluated for inhalation exposure hazard and seven mitigation systems installed**
- **EPA entered into Administrative Order with dry cleaner owner/operator**
  - **Received financial contribution (< \$1 million)**
  - **Deed restriction placed on property**



PCE subslab soil gas concentrations range from 209 to 3,310,000 ug/m<sup>3</sup>



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## **Upcoming Investigation**

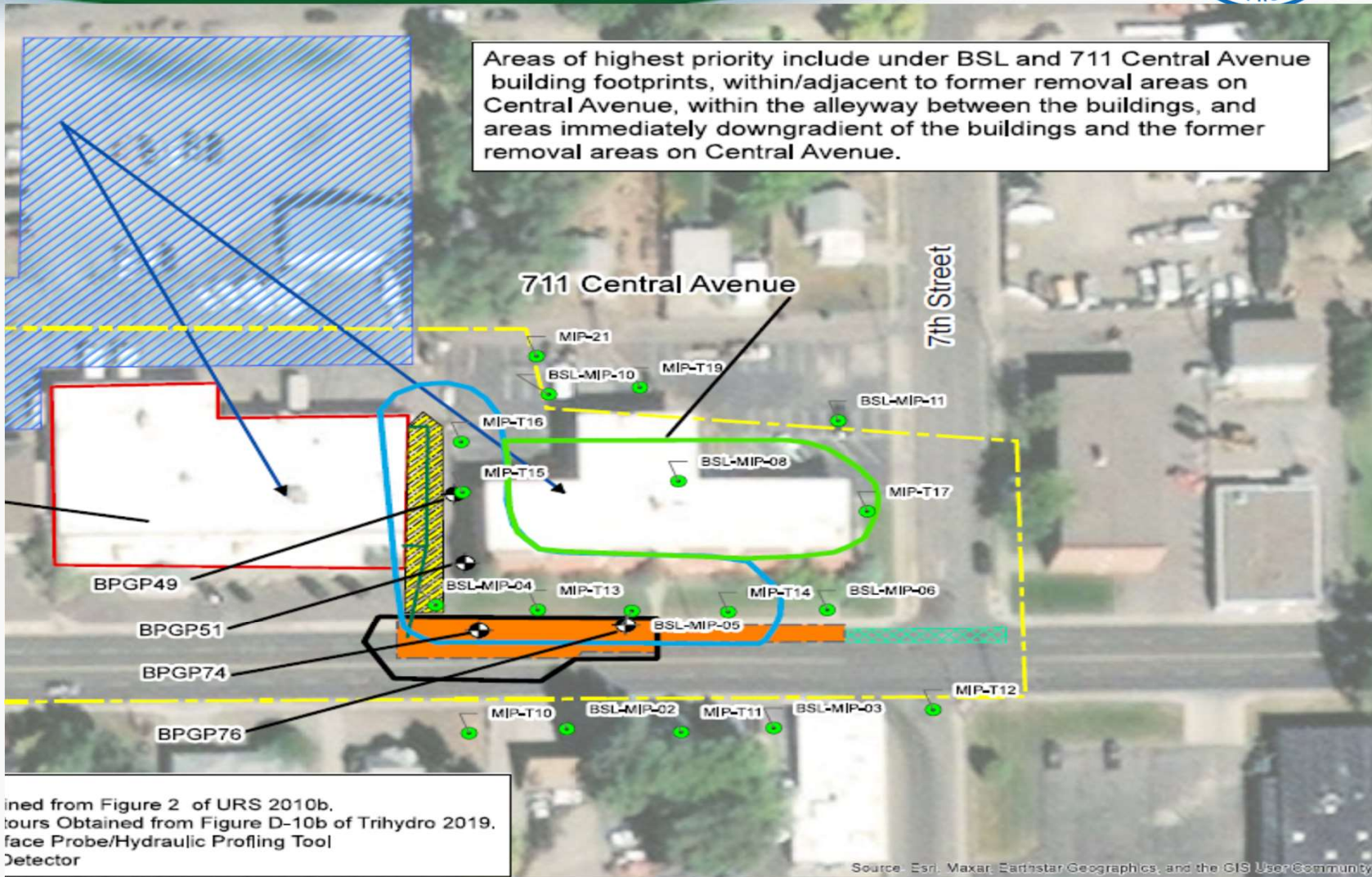
**Advance up to 30 soil profiling borings and transition to an adaptive site sampling approach based on field findings. All locations will be continuously logged and semi-quantitatively assessed using a Membrane Interface Probe (MIP).**

**MIP technology uses heat to volatilize and mobilize contaminants for sampling**

**Up to 100 soil samples will be collected for analyses.**



Areas of highest priority include under BSL and 711 Central Avenue building footprints, within/adjacent to former removal areas on Central Avenue, within the alleyway between the buildings, and areas immediately downgradient of the buildings and the former removal areas on Central Avenue.

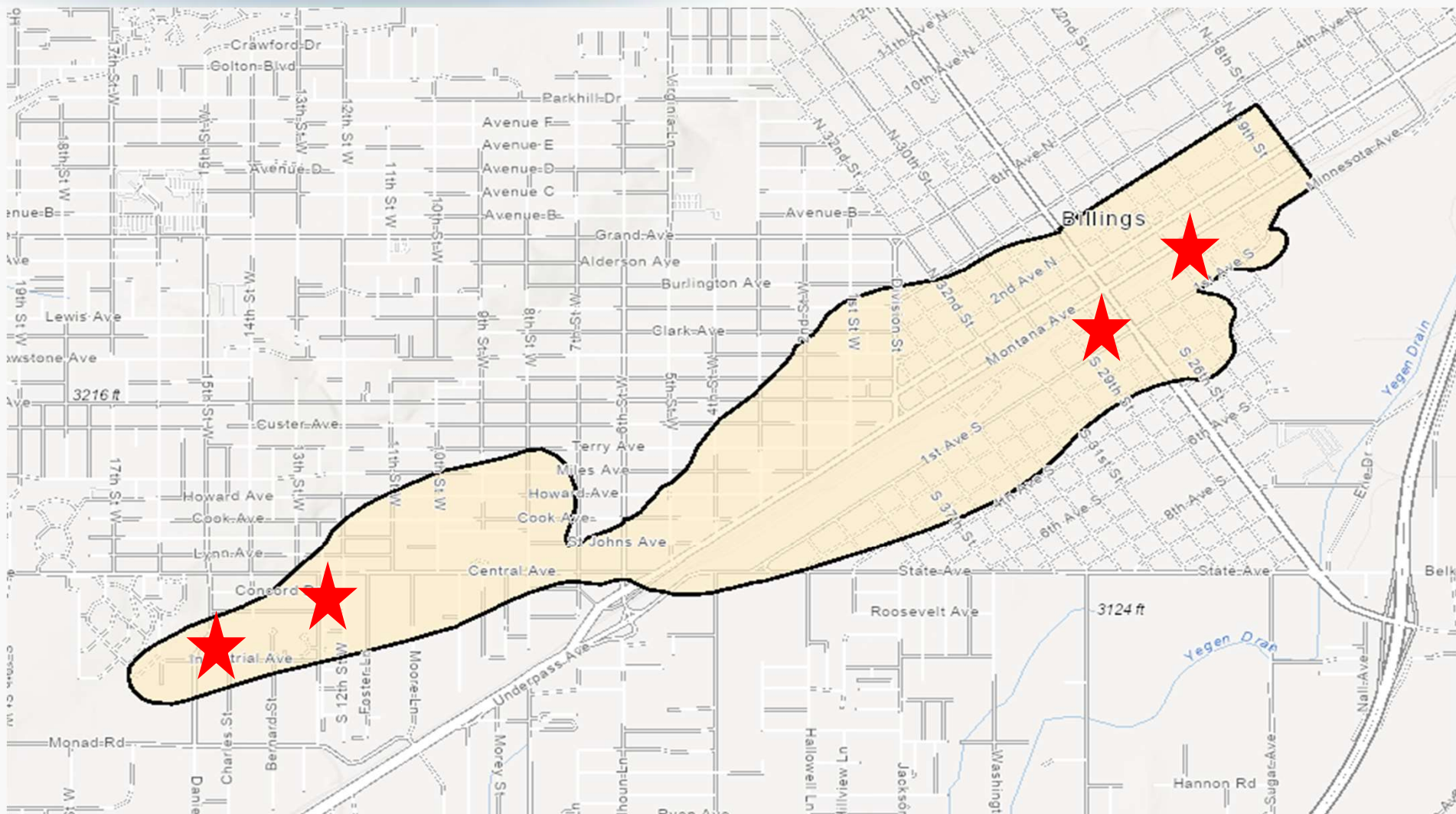


Derived from Figure 2 of URS 2010b, and data obtained from Figure D-10b of Trihydro 2019. Data obtained from Surface Probe/Hydraulic Profiling Tool and Groundwater Detector.

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



# OU3 – Sitewide

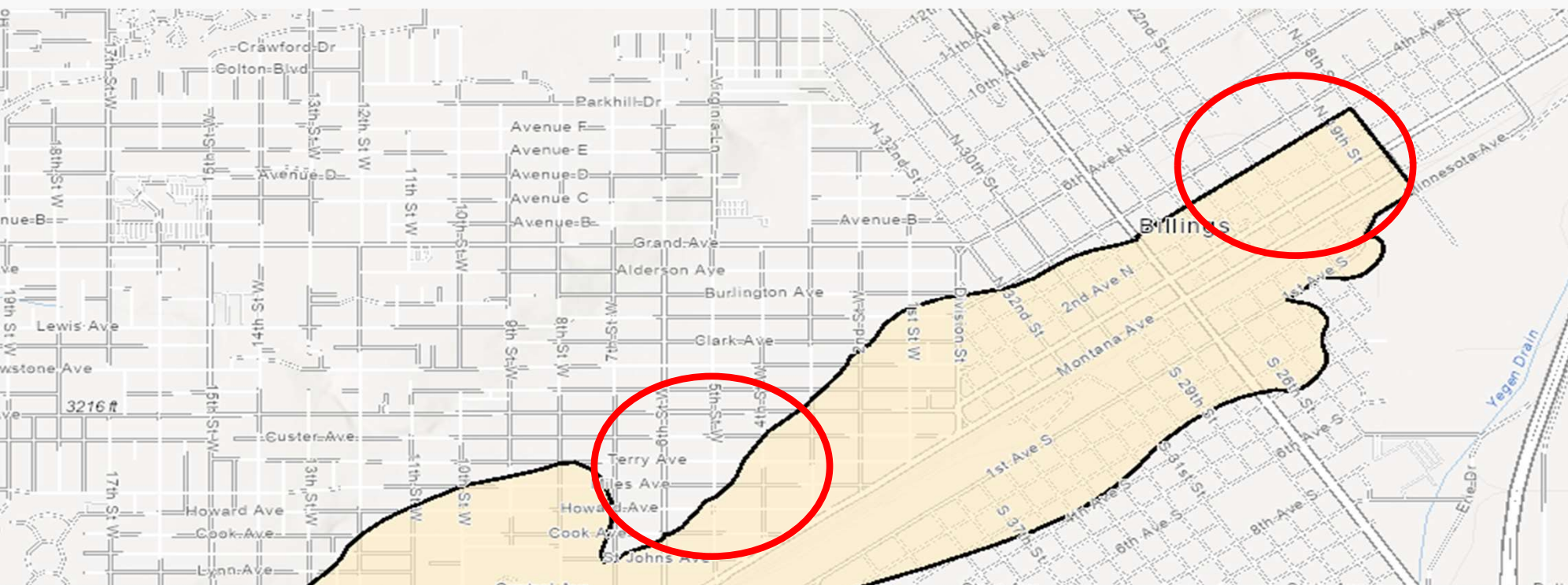




# Investigations

**Will continue to sample groundwater twice a year as well as any new irrigation wells**

**Plan to install additional monitoring wells in 2024 to delineate plume around P66 refinery and around 7<sup>th</sup> and Miles**





## Where do I find information about the site?

[www.epa.gov/superfund/billings-pce](http://www.epa.gov/superfund/billings-pce)

Wondering whether a property is located within the **Billings PCE study area**? <https://arcg.is/0KyfvL1>



# Contact Information

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# Questions/Comments